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FOOD DIGEST

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January — March 1979

National Information Centre for Food Science and Technology

Central Food Technological Research Institute, Mysore-570 013.
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NATIONAL INFORMATION CENTRE FOR FOOD SCIENCE & TECHNOLOGY
AT
CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
MYSORE 570 013, INDIA

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STORAGE

1 Estimate of losses to foodgrains during post-harvest handling, processing and storage

Stage where the loss ic caused	Estimated loss in thousand tonnes	Estimated loss expressed as %
Threshing yard	1,317,708	1.68
Transport	117,478	0.15
Processing	748,913	0.92
Storage:		
i) Rodents	1,957,940	2.50
ii) Birds	668,105	0.85
iii) Insects	1,992,116	2.55
iv) Moisture	534,114	0.68
Estimated total loss	7,386,424	9.33

For these estimates loss is worked out on the basis of food value only. Drying which causes loss in weight but not loss in food value, spillage, loss in weight on account of theft, loss on account of conversion where some quantity may be lost for human consumption but is available for animal consumption, are not considered as loss. (Tropical Stored Products Information. 36; 1978; 28)

2 Preservation of oilseeds by infiltration under vacuum

A method to extend the storage life of walnuts salted groundnuts, etc. for upto one year at room temperature is described. It involves the infiltration of the products under vacuum with molten fat

treated with antioxidants. Oxidation of the lipids in the oil seeds is prevented by the infiltrating fat which blocks the air channels. The technique can be applied under normal factory conditions as a batch or continuous process, and material treated by this method is suitable for all traditional applications. (Food Manufacture. 53(8); 1978; 61)

FOOD ADDITIVES

3 New additive that keeps fish fresh

An additive (BL-7) was developed earlier in Japan that keeps crustacea, such as lobsters, fresh by preventing their surfaces from turning black. Now a freshness-preservation agent (BL-F) for use on ordinary fish has been developed. Tests have proved that the additive is very effective on fish, such as mackerel, mackerel pike and horse mackerel.

Based on tryptophan as the principal ingredient, BL-F, besides preventing the decomposition of the protein in fish (by activating the enzymes in the fish tissues), is credited with long lasting effects in the prevention of the growth of mold, sterilization, prevention of acidification of oils and fats, preservation of fish color, etc.

The additive is administered in a simple manner; fish are immersed for 5-10 sec in a 0.3-0.5% BL-F seawater or fresh water solution. They are then kept on ice, put in cold storage or frozen for storage. (Research and Industry. 23(2); 1978; 106-7)

4 Mono ammonium glycyrrizin

Mono ammonium glycyrrizin (MAG) is 50 times sweeter than sucrose. But the relative sweetness is difficult to assess because of the

accompanying licorice flavors. Its sweetness is equivalent to fully ammoniated glycyrrizin and is essential where color and pH sensitivity are important factors. In some products, MAG can be an effective replacement for saccharin at one to three times the original saccharin concentration. Suggested applications include beverages, syrups, low calorie preparations, chocolate and cocoa preparations, meats and animal and pet foods. (Processed Prepared Food. 147(8); 1978; 94)

5 Surfactants in peanut butter

Surfactants perform a crystallization function in peanut butter. In peanut butter, which contains about 50 per cent peanut oil, the oil tends to separate during storage. Separation can be prevented by entrapping free peanut oil in the crystallized surfactant. Atmul 124 at 1.0 to 2.5 per cent has proven its ability to overcome oil separation. (Processed Prepared Food. 147(8); 1978; 88)

6 Food grade conditioning

The high porosity of syloid silica conditioning agents enables to absorb upto three times their own weight of many liquids. This is particularly useful in producing a traditionally liquid product such as a flavor, oil or other ingredient in a powdered form. The powders can be handled more easily and can be measured and blended more accurately and efficiently. In certain convenience foods, the additive (flavour, colour, oil) is safely trapped inside the Syloid silica pores until the food is mixed with water. Because the Syloid silica has greater affinity for water than any other liquid, water displaces the entrapped additive releasing them for use at precisely the right time. (Processed Prepared Food. 147(8); 1978; 70)

7 Tomato flavor extenders

Tomato flavors and extenders can replace both the solids and

the flavor of tomatoes and tomato pulp and powder at levels of upto 50 per cent of the natural pulp or powder and 100 per cent of the flavor. The extenders contain starch, milk solids and dextrose, that when dispersed in water thicken very similarly to natural tomatoes.

The pulp and powder extender products and flavors can be used in both the instant and cooked foods including liquid or dry soups and sauces, pre-cooked entrees, salad dressings, snack foods, blended seasonings, tomato drinks and any other products made with tomatoes, tomato pulp or tomato powder. (Processed Prepared Food. 147(8); 1978; 72)

8 Cocoa powder replacers

A specially formulated, low-cost cocoa powder replacer has been developed. Nocoa is an equal strength, heat-stable pound-for-pound alternative to cocoa powder. This product was designed to replace upto 50 per cent of the cocoa in most foods and beverages. Containing natural and artificial flavors, Nocoa provides aroma, color, texture, mouthfeel and bulk. Besides the cost savings there is good flexibility in the formulation of Nocoa that allows for alternations to compensate for the variance in the flavor and taste characteristics in cocoa powders. (Processed Prepared Food. 147(8); 1978; 79)

9 Cocoa substitute from brewer's yeast contains no chocolate

A product that smells and tastes like cocoa but contains no chocolate is under test marketing. The replacement product is made from special brewer's yeast and could eliminate dependence on imported cocoa beans for drinks, candies, coatings and baked goods. (Food in Canada. 38(6); 1978; 41)

10 Reduction of nitrite and nitrate addition to meat products

Possible ways of reducing the quantities of nitrite and nitrate added to meat products were considered in view of the danger of carcino-

genic N-nitroso compounds being produced. The extent to which these curing substances are converted is largely determined by the thermal treatment and by enzymatic and bacteriological processes during manufacture and storage. Additives with reducing properties or with properties which lower the pH value cause a reduction in the residual nitrite content but this is associated with an increase in the residual nitrate content. Compounds with activated methylene groups such as sorbic acid can react with nitrite, forming very strong bacteria-inhibiting substances. When using additives of this kind, it seems possible to achieve the required bacteriological stability of meat products with very small quantities of nitrite. However, before such methods are permissible, the nitrite reaction products must be thoroughly tested to ensure that they are harmless to health. (Food Manufacture. 53(7); 1978; 23)

11 Body makes its own nitrite and nitrate

Recent studies indicate that human body synthesizes both nitrites and nitrates. Cases of bacterial nitrite production in the stomach promoted by abnormally high gastric pH have been observed. In persons with high pH stomachs, more nitrite was formed in the stomach than in the mouth. Another source of nitrite may be synthesis from ammonia and and organic nitrogen compounds in the upper intestine. It now appears that nitrite can be converted back to nitrate in the lower intestine.

Some of the nitrite and nitrate can be absorbed into the bloodstream. Absorbed nitrite is destroyed, but nitrate is recycled through the saliva and becomes available for transformation to nitrite. Nitrite can react with food amines in gastric conditions to form potentially carcinogenic nitrosamines. (Food Products Development. 12(4); 1978; 104)

12 New generation of non-toxic non-absorbable food additives

The new generation of food additives are of a large molecular size that cannot pass through the wall of the human intestine.

The development of non-absorbable food colorants, which are non-toxic and can be formulated to match the important color shades in soft drinks now on the market, was recently announced by Dynapol scientists. These products are known as polydyes and are currently in the second year of a safety testing cycle that may run an additional three years prior to commercialization.

This unique approach was conceived to permit the safe use of colorants in food without the potential risk associated with the long-term ingestion of food additives, which are readily absorbed and eventually come in contact with many organs in the body. The new development will benefit not only the food industry but also the consumer, to whom food products with appealing color qualities and improved safety will continue to be available. Ample experimental evidence is available in support of the conclusions that the polydyes fully satisfy the technical and aesthetic requirements for coloring beverage products. (Food in Canada. 38(6); 1978; 40)

PROCESSES

13 Defatting of groundnuts and soyabeans

A simple process for producing defatted groundnuts and soyabeans by using hydraulic-pressing has been developed at the Biochemistry and Food Technology Division of the Bhabha Atomic Research Centre (B.A.R.C).

By this process, 70-80 per cent oil can be extracted with very little changes in the shape of the seeds. The seeds can actually be restored to their original size and shape after oil extraction and converted into ready-to-eat snacks by roasting and puffing.

The process developed on a laboratory scale consists of simple steps: pressing; reconstitution; drying and roasting. Either raw

(with skins), or de-skinned size-graded groundnut kernels, in batches ranging from 100 g to 1 kg are hydraulically pressed for one hour using a perforated aluminium mould and a plunger. After pressing, the seeds, in the form of pressed cake, are disintegrated into distorted seeds in a hammer mill, and collected in wire-mesh trays for further processing.

The trays containing distorted groundnuts are dipped in water containing salt (2 per cent), maintained at 87-90°C for 3-5 minutes. The groundnuts thus reconstituted to original shape are then removed from water. Salt is added only to impart a salty taste. The reconstituted groundnuts are dried to 8-9 per cent moisture in an air dryer at 60°C for 4-5 hours to make them suitable for the roasting operation; this step also gives stability. The dehydrated groundnuts are then subjected to roasting at 90°C for 5-6 minutes to impart palatability. The roasted groundnuts, packed in flexible pouches or metal cans, have been found to be stable for storage upto one year.

The defatted groundnuts and soyabeans have high protein value and increased shelf-life, the latter property being due to a reduction in oil rancidity. Such defatted oilseeds retain their economic value because the bulk of the edible oil in them is recovered before production of the protein-rich meal. (Science Newsletter. 2(1); 1979; 4-5)

14 Application of endo-polygalacturonase to fruits and vegetables

The enzymatic treatment of fruits and vegetables, including two varieties of tomato developed for mechanical harvesting, with endo-polygalacturonase was studied with refrence to condensability, juice yield, viscosity, light transmittance and colour. It was found that enzyme treatment reduced most vegetables to single cells which are suitable for further processing into juices, baby food, dried soups and sauces. Condensability and juice yield of tomatoes bred for mechanical harvesting were significantly improved. In fruit, erzyme treatment was found to increase juice yield, decrease viscosity and increase light transmittance. The colour of fruit juice also became more intense after treatment

with endo-polygalacturonase. (Food Manufacture. 53(8); 1978; 61)

15 Citrus flour - A new fiber, nutrient source

A process that uses a carefully controlled mix of grape-fruit and orange peel, seeds, and pulp residue is blended with sesame flour and milled - producing a fine mesh, pale yellow product with high levels of dietary fiber plus protein and other nutrients.

The citrus flour represents a more complete use of portions of fruit that were formerly processed into cattlefeed, fertilizer, or simply thrown away. Flour made from the residue captures the protein and fiber found in the seeds and peels (10.5 per cent protein with a calculated Protein Efficiency Ratio of 1.7 to 1.8; 13 per cent crude fiber; vitamins C, E, and A, and significant amounts of minerals). It also offers a bland citrusy flavour and pale yellow color.

At a 2½ per cent level, citrus flour doubles the amount of crude fiber found in bread from normal sources. (Food Product Development. 12(7); 1978; 36)

16 Indigenous instant tea

Instant tea samples with an excellent quality of brew have been manufactured for the first time with indigenous technology at a pilot plant at the Tocklai Experimental Station, Jorhat, of the Tea Research Association, Calcutta. In two factories in South India, which use foreign technology, the poor quality of the product has been the main problem in instant tea production. This problem has been successfully overcome in the Tocklai process. The cup quality and aroma of the brews of instant tea samples produced in the Tocklai plant are indistinguishable from the brews of good quality orthodox teas, according to the tea tasters. The Tocklai process is based on the upscaled bench process developed at the University of Calcutta under a Tea Board Scheme.

The team of project scientists at Tocklai are now engaged in

The team of project scientists at Tocklai are now engaged in collecting engineering and processing data to finalize a blueprint for commercial production of hot and cold-soluble instant teas for markets at home and abroad. (Industrial News Digest. 1(12); 1978; 8)

17 Powdered booze

All you have to do is add water. Each particle of powder contains a minute droplet of 200 proof pure grain alcohol.

The product itself resembles a gelatin desert powder with one very potent difference. Inside each powder particle, about six microns in size, is a minute droplet of 200 proof pure grain alcohol. Each tiny alcohol spirit is encased in a tasteless shell or coating. The coating material is a mixture of corn syrup, straight grain alcohol, and water. Mixed into a slurry, the alcohol forms the nucleus of the coating and is then dried at temperatures in the spray drying tower which are low enough to prevent the evaporation of alcohol inside the coating.

What results is an odorless white powder with an alcoholic content of approximately 30 per cent by weight with the carrier making up the remaining 70 per cent. (Food Engineering International. 3(7); 1978; 13)

18 Whey protein concentrate

WaPRO 29 is a bland, cream colored, whey protein concentrate processed from sweet dairy whey by reducing the lactose content to approximately 54 per cent and the minerals to approximately 10 per cent and spray drying the concentrate. The protein fraction consists of lact-albumin and beta lactoglobulin. (Processed Prepared Food. 147(8); 1978; 94)

19 Deep fat frying with butter oil

Experiments were made to find out whether the addition of sili-

cone (methylsiloxane) to butter oil improves the chemical and physical stability of butter oil during actual deep fat frying conditions and whether the storage stability of potato chips fried in siloxane-treated butter oil would be increased. The chips were fried on a daily demand basis in butter oil, in butter oil with 10 ppm of silicone and in a corn oil containing silicone. The storage stability was tested by peroxide value. The thermal stability of the oil was determined with the smoke point test, total acid content and non-urea adduct forming esters. Results showed that the addition of silicone to butter oil improved its stability and increased the flavour of the chips and gave higher storage stability. (Food Manufacture. 53(7); 1978; 23)

20 Agglomeration in a fluidised bed

To achieve good dispersion and quick reconstitution, instant food products must consist of very fine particles. This very fine, powdery structure will, however, result in disadvantages which can be overcome by controlled agglomeration. A simple, economic and flexible method consists in remoistening of the dry powder and re-drying, the operations being carried out in a fluidised bed. The equipment designed for the process and the technology used are demonstrated and typical applications, eg. manufacture of cocoa beverages and soup powders, are described. (Food Manufacture. 53(7); 1978; 23)

21 Spray dried honey

Super Bee is a specially prepared, spray dried, honey product with all the characteristics of pure honey. One-half to three-quarters of a pound should be used to replace one pound of liquid honey. The flavor of Super Bee spray dried honey will not bake out in any baked goods, will not crystallize in formulation and has the humectant properties and high heat stability of pure honey. (Processed Prepared Food. 147(8); 1978; 78)

22 Oxygen barrier preserves fish flavor

Fresh frozen fish during long distance shipping develops off-odours and flavours due to the breakdown of fat molecules of fish by oxygen. A process which removes air from the package and heat seals with wrapper of a suitable oxygen barrier film has been developed. Taste panel tests indicated that the conventionally packaged fish had off-flavor three times stronger than vacuum packed fish. (Processed Prepared Food. 147(8); 1978; 55)

23 Invisible continuous pasteurisation

The shelf-life of jar packed jams, which usually curtailed by moulding, can be significantly extended if, after filling and closing the contaminated surface layer of the jam is briefly heated to 70-80°C in a specially designed microwave heating unit. The jars pass through a heating tunnel in which the temperature of the surface layer of the jam is raised by increments to the desired heat. All the jars in a charge, including the first and last rows, are heated uniformly. Since microwaves cannot penetrate metals, the lids of the jars must be made of plastics. The apparatus takes 30 sec. to warm up and is simple to operate. The same pasteurising process may be applied to other foodstuffs packed in glass jars or plastic pots. (Food Manufacture. 53(8); 1978; 61)

24 A new approach to food sterilization

A continuous sterilizer that features total flexibility. The sterilizer's completely new design principle enables packages of a wide range of different can sizes and materials to be processed simultaneously in the same machine. Its main feature is a set of pallet-type carriers, that are introduced in loaded condition and then taken through the machine in a continuous movement by a simple conveying system. Using infeed conveyors, the pallets are loaded with cans and/or other containers. To ease in-sterilizer transport the pallets are mounted on

wheels. Entering through a double-gate, the loaded pallets are carried upward in the sterilizing section via a continuous vertical conveying system. Because the cans or other materials are loaded or pallets, differing sizes of containers that require the same sterilizing time can be processed through the system. (Processed Prepared Food. 147(4); 1978; 77)

BYPRODUCTS AND WASTE UTILIZATION

25 Dried molasses products

The technical capability to dry molasses on a variety of carriers including certain fibres, flours, starches or protein has been indicated. By this a manufacturer can take advantage of the functionality of dried molasses without changing his ingredient statement.

Of particular interest to manufacturers of products with a high dietary fibre content is the Dri-Flo 2000 Series. Dri-Flo 2001, for example, is made up of 75 per cent molasses solids, 15 per cent soya bran and 10 per cent cornflour. For other products, both the types and ratios of the carriers can be changed.

SuCrest's drying technology produces a freeflowing powdered product which retains all the flavour and functional integrity of natural liquid molasses. Moreover, the product remains freeflowing without the use of artificial flow aids such as magnesium stearate, silicon dioxide or tricalcium phosphate. (Food Trade Review. 48(4); 1978; 214)

26 Methane from food wastes

Food wastes from canneries and other fruit and vegetable processors can be successfully converted to methane gas according to stud-

ies by the CSIRO Division of Food Research, North Ryde, NSW. The methane can be burnt to fire boilers. The food waste is broken down into gas by bacteria confined in an airtight tank.

The 4000-litre digesting tank at the Division has been consuming upto 18 kg of orange peel pellets each day and in the process producing 7 m^3 of gas containing 50-55% methane. (Food Technology in Australia. 30(4); 1978; 159)

27 Small-scale extraction and processing of banana fibre

Details are given of the distribution and uses of various members of the banana family. Samples of leaf sheath fibres examined were much coarser than jute and weaker than a low-grade abaca. Percentage extension to break was similar to that of abaca. The fibre is lignocellulosic and it can be dyed with various classes of dye including the reactives. Extraction by hand and with a power-driven raspador is described together with simple methods of spinning, weaving and rope-making. A fine cloth can be made by weaving single fibres, while a coarse cloth suitable for sacking or matting, can be made by weaving the spun fibres. Banana fibres spun with other fibres can be used to form ropes suitable for agricultural purposes. (Tropical Science. 19(4); 1977; 173)

PROCESSED PRODUCTS

28 High protein peanut flour

A new method has been developed for the direct extraction of peanuts to produce a product that can be ground into a bland, white flour with high protein solubility that is desirable for food use.

The procedure currently in use, prepress-solvent extraction, subjects the peanuts to high temperatures which imparts a tan colored

flour and reduce protein solubility, thus decreasing the flour's desirability for some food products. By eliminating high temperatures of cooking and pre-pressing (the pressure runs the temperature up) to remove oil from the peanuts, the solubility of the protein can be kept high.

The new process involves flaking the kernels to 0.010 to 0.007 inch (although thickness did not appear significant), heating to 180°F for 30 minutes at 12 percent moisture, then extracting the oil with hexane for 2 hours at a flake to hexane ratio of 1 to 2. The extracted flakes are desolventized and ground into flour.

The resulting flour is white and tasteless and contains less than 2 percent oil (attempts are made to reduce it to 1 percent). Protein solubility is about 85 percent (as compared with only about 60 percent for prepress-solvent extracted flour).

The flour, which is almost as white as wheat flour, has been used experimentally in bread and biscuit formulations replacing upto 15 percent of the wheat flour with good results and about doubling the protein content. It has also been used experimentally with good results in ice cream as a replacement for upto one-half of the non-fat dry milk solids. A very palatable milk has also been made from the flour with a protein content comparable to cow's milk (about 3 percent) and has about the same keeping qualities. When the milk 'sours' it also forms a curd, much the way cow's milk does. (Agricultural Research. 26(11); 1978; 5)

EQUIPMENT & MACHINERY

29 Power driven mini salseed decorticator

The power-operated portable mini decorticator consists of a stepped iron roller-type beater (diam. 19 cm, length 14 cm) which rot-

ates in a trough-like grate with spacings and a built-in fan to blow off the lighter matter. The sal fruits are fed from the hopper. The beater with channel grooves on its external surface rotating at 90 rpm, helps rupturing of the fruit by abrasion against the grating. The grate is of semicircular shape formed by arranging a number of mild steel flats with a spacing of 6 mm, placed horizontally on their edges. The fan is mounted on a steel axis, which revolves on a pair of bearings at both ends. The blades of the fan made of iron sheets are bolted to the axis, which is fitted with a pulley of 5 cm diameter on one end and is connected by a V-belt to a bigger pulley of 12 cm diameter of the beater shaft on the same side. The speed of the fan is 900 rpm.

The motor of 1 hp (with a 6 cm pulley) is coupled with counter-shaft drive fitted with ball bearings over the blower fan. This shaft is provided with two driver pulleys of 36 and 10 cm diameter on either side. The motor pulley is coupled with the beater pulley fitted on to the other end of the beater shaft. The fruits fed through the hopper fall into the trough, are beaten by the roller and are thus shelled. The shells and kernels pass through the grating spacings and fall on to an inclined plane from where they are separated by the blower fan. Kernels slide down towards the fan by their weight, whereas the light shells are blown away in the opposite direction. Before arriving at the optimum conditions, several runs were conducted using motors, belts and pulleys of different materials of construction.

The capacity of the unit is 75 kg of sal fruit per hour. The decorticated fraction obtained in a single pass contained 96% kernels and 4% hulls. The degree of decortication was cent per cent. The cost of the decorticator, including the motor, is about Rs.1,500. (The Oils and Oilseeds Journal. 31(1); 1978; 27)

30 Steam peeling machine

A wide range of fruits and vegetables including tomatoes, peaches, apricots, plums, apples, pears, potatoes, celery, carrots,

cucumbers, kohlrabi and paprika can be peeled using the machine.

The machine has a newly developed pressure tank operating in conjunction with an electric sequence control. Venting of the pressure vessel during closing allows pressure ratings to be adapted to the product being peeled. Fruits or vegetables need not be presorted or sized. After cleaning and washing, they are fed directly to the machine by an elevating conveyor. Filling is effected from the top through an opening in the pressure tank. To ensure gentle loading without bruising, the tank is tilted through approximately 45° and the produce slides down. This is particularly important when peeling tomatoes or delicate fruits such as peaches for canning. After filling, the pressure tank returns to an upright position and steam is introduced for peeling at a pre-set pressure. When the peeling cycle is completed - for tomatoes it is less than 8 s-the skins are separated and the peeled products are discharged through the tank opening which is then swivelled through 180°.

A machine with a tank capacity of 1000 litres peels tomatoes at a rate of 9 t/h. (Food Engineering International. 3(7); 1978; 39)

31 Automatic sardine scaling machine

The Sardine Fish Scaling Machine strips scales from sardines without damaging the fish and automatically adjusts to the size of each fish upto 3 ounces (84 g) weight. To assure a high quality finished product, it will not cut the fish or damage the skin. It processes 60 fish per minute by hand and upto 200 per minute with an optional fish feeder.

The machine is constructed with all corrosion resistant materials. Scalers are made of PVC with stainless steel knives, the gears are bronze and all bearings are equipped with Alemite fittings. The unit is mounted on a hot dipped galvanized frame and is powered by three waterproof electric motors each of ½ h.p. (Food in Canada. 38(3); 1978; 47)

32 Equipment for topping carrots

Ungraded, steam or lye-peeled carrots can be topped and tailed at high speeds with an automatic equipment. Depending on size and shape, upto 10 t/h can be processed.

Fed into the machine by a flighted belt elevator and chute, the carrots are separated by a combination of friction and inherent product inertia. They are then transferred by centrifugal force to a knife which cuts one end. This operation is followed by a similar one for the other end. Tops and tails are removed at the bottom, and the processed carrots are ejected sideways.

All contact parts are made of stainless steel and food-grade rubber. Topping adjustment can be varied from 0 to 25 mm during operation. At the end of each production shift, the machine is cleaned in place in about 5 min. (Food Engineering International. 3(6); 1978; 73)

33 Vibratory sifter

The Bench-mounted vibratory sifter is for small and medium sized bakers as well as for applications in the pharmaceutical industry. Flour or other material to be sieved is put into a hopper and the sieved material is collected in containers kept below the sifter. With a 24 mesh sieve, wheat flour is sieved at the rate of 12 kg per minute. Sieves are 35.56 cm square in size. An unskilled person can quickly replace the sieve. It is reported that weevils and other impurities such as jute fibre can be removed from wheat flour only with this type of sifter. Basic eccentric mechanism is provided with three variations of eccentricity to suit the product to be sieved. (Industrial Products Finder. 7(1); 1978; 69)

34 Metal detector conveyor

A metal detector vibratory conveyor that handles wet or dry products and eliminates the dangers of foreign metal parts in continuous

process lines has been designed.

Meant for use in the vegetable processing industry, it is a self-contained unit operating on electricity and compressed air. The detector is magnetic and operates over a glass fibre vibrating pan which has an abrasion resistant gel coating.

The discharge chute actions automatically for product reject whenever metal is detected, without stoppage of the product flow or other process plant. (Food Trade Review. 48(4); 1978; 205).

35 Removes solids from slurries

A new vibrating screen separator is designed to remove a high degree of unwanted solids from crude process liquids and effluents, leaving a comparatively clean liquid which can be further processed or disposed of. Typical applications include brewing, vegetable and fruit processing, and effluent treatment. (Food Manufacture. 53(7); 1978; 73)

36 Color-quality control for food product

Precision color-quality control for a wide range of food produce is possible with these easy to operate and accurate Agtron instruments. Models are available to accommodate powders, purees, pastes and liquids including snack foods, cereals, cookies, crackers, tomatoes and whole fruits. (Food Engineering International. 3(6); 1978; 64)

37 Fruit colour sorter

Designed to remove brown, black or molded berries from a product line, this color sorter has been used successfully by processors of frozen cranberries, blueberries and loganberries. Capacities average 300-400 lb per hour.

In a typical operation, the berries are conveyed from the freezing facilities to the sorter. The berries begin the sorting process in

the hopper, where they are transferred to the rollers. Then, they are inspected by the three-eye scanner. Acceptable berries free-fall into a receiving bin, while damaged or off-color berries are air-jetted to a reject bin. (Food Engineering International. 3(8); 1978; 47)

38 Mixer for wet and viscous material

Sigma mixers are used for viscous and wet material such as heavy pastes, ointments, pigments and putty. Kneading and mixing is done by two overlapping type blades. The blades run at different speeds in opposite directions. Mixer body and blades are made of mild steel or stainless steel to suit requirements. For easy removal of material, hand or motor operated gear system is provided to tilt the body. Five models are available with sizes ranging from 15.24 cm x 15.24 cm to 60.96 cm x 60.96 cm corresponding to working capacities of 2 to 135 kg. (Industrial Products Finder. 7(1); 1978; 125)

39 Machine gives liquids the shake

Universal shaking machine, is for dissolving and dispersion of solids in liquids; extraction of soluble and not-so-soluble solids from insolubles; emulsification of immiscible liquids; as well as for extraction of solutes from one liquid phase into another. It shakes material contained in bottles, flasks or test-tubes continuously and energetically. The shaking plate accommodates bottles or clamped sieves. There is an automatic timer and a rheostat for speed regulation between 80 and 250 strokes per minute. (Industrial Products Finder. 7(1); 1978; 275)

40 Machine for applying flavour mist to chips

An automatic machine enables flavours to be applied to potato chips and snack foods without waste or damage to the chips. Unlike conventional methods which apply flavourings to the product either in dry form or in a slurry, the new system uses an emulsion made of vegetable oil and flavour powder. The emulsion is pumped under pressure

through a series of atomizing heads which create a fine mist and are completely coated.

Mist intensity and hence the amount of flavouring required on the chips is fully controllable. Easy to operate, the machine can handle the output of practically any size of chip and snack fryer used today. The whole system is sealed to avoid waste and contamination of the working environment. (Food Engineering International. 3(7); 1978; 45)

41 Spray nozzle produces fine dispersion of droplets

Combining mechanical and pneumatic spray generation, this industrial-type nozzle produces a very fine dispersion of droplets otherwise available only with laboratory-type units. Spray capacity is 1 to 20 litres/h and droplets size can be varied from 5 to 25 m to meet specific requirements.

Designated type Nx, the unit can easily be retrofitted to existing equipment. It is smaller in size than the previous model and can be supplied in a corrosion-proof version with brass body and stainless steel core. (Food Engineering International. 3(8); 1978; 36)

42 Rice rollers for extra lustre

Castle rice rollers are for use in rice mills for dehusking rice paddies. They have excellent resistance to wear and tear, and give extra lustre to the grain. Blackening of an occasional grain is entirely eliminated. Various sizes and types are available to suit different brands of rice mills. It is said that the rollers have been specially engineered for lightness to reduce the noise factor as well as the wear-and-tear on gears and bearings. Black rollers are not manufactured to avoid the risk of the colour rubbing on the grain. Polyurethane rollers are also available. (Protein Foods and Nutrition Development Association of India, Newsletter No.97; 1978; 7)

43 Conveyor cools candy

Rotex cooling unit is a three-stage, endless conveyor system that uses chilled or cooled air for cooling toffee, sweets and tablets. A specially designed spreader arm spreads the material at about 80°C over the full width of the moving conveyor which is guided to the second stage by the guide plates provided. The material is cooled down to about 50°C in the second stage. The third stage cools it down further to about 25° to 30°C, ready for packaging. Removable glass-fibre trays below the belt collect the finished product and also, separate the stages for the circulating air. Detachable doors on the sides provide isolation and facilitate easy cleaning and maintenance. Adjustable screws at the bottom of every vertical support obviate the need for expensive foundations and compensate for the uneven flooring. All rotating parts are mounted on ball/roller bearings. The capacity is about 6 tonnes of sweets per 8-hour shift. Total power required is 4.5 HP excluding the airconditioning unit. (Industrial Products Finder. 7(1); 1978; 191)

44 Insulated doors to cold stores

A complete line of cold-storage doors includes power and manually operated types, those that slide horizontally or lift vertically, overhead sectional, hinged doors and pass conveyor models for all sorts of applications down to -54°C. Fire doors with 3-hour 'A-label' ratings and special doors are also available.

The lightweight urethane-filled doors are said to provide the best insulation. Horizontal sliding models feature the original angle door track design that assures the tightest door-to-wall fit. Full-perimeter adjustable seals compensate for any uneven wall surfaces. The doors are available in a choice of galvanized steel, stainless steel or tough PVC finishes. (Food Engineering International. 3(7); 1978; 45)

45 Counter current cooling

Conventional cooling system for blanched vegetables prior to

freezing operate at a very high rate of water consumption with consequential effluent output and high charges. To ease the water/effluent problem, and faster cooling to lower temperatures as well, the new machine is known as counter cooler and works on the principle of passing the product through the coolant in the opposite direction to the coolant flow. (Food Processing Industry. 47(558); 1978; 57)

46 Food freezing tunnel for small processor

This is the new 'Mini' Kyrospray food freezing tunnel that has been designed to bring CO_2 freezing and chilling within the economic reach of the small processor. Unique benefits include simple installation, minimum floor space, fast and economical operation, easy cleaning and maintenance, and fast freezing cycles. The Unit will fit into a work area as small as 13 ft x 3½ ft and will freeze upto 400 lb/hr. The freezer's low initial cost and high production capability make it ideally suited for vegetables,fruits, fish, meat, dairy products, bakery goods, speciality foods, fast foods, and precooked restaurant and hospital meals. (Food Engineering International. 3(6); 1978; 89)

47 Pulper with articulated beaters

Higher product yield and improved product quality are the main features of this pulper/refiner of novel design. Unlike conventional systems which use fixed beaters mounted on shafts, the new equipment is fitted with a series of articulated paddles arranged radially on a rotating shaft. When rotating, the shaft produces a centrifugal force, thus slightly pressing the paddles against the product being handled. This is particularly important when processing partially unripe or defective fruits, since it allows optimum squeezing of the ripe parts while expelling the unsuitable parts as waste. Therefore, the flavour of the refined juice is not affected by unripe fruits.

Three models are available with capacities of 7, 15 and 30 t/h. Parts in contract with the product are made of stainless steel and all

models have CIP facilities. (Food Engineering International. 3(6); 1978; 73)

48 Crateless retort

A new crateless retort system automatically sterilizes and cools canned products in any standard size container at process temperatures upto 260°F (126°C). By varying the number of pressure vessels and the length of the transfer and cooling tanks, a variety of production capacities can be obtained. (Food Engineering International. 3(8); 1978; 44)

49 Convection ovens

A new generation of convection ovens for the baking industry features 12-inch thick mineral wool insulation which surrounds the bake chamber; improved heat transfer with the use of convection jets; the ability to control the bake by air flow as well as by temperature; and the optional multi-fuel burners which can use either natural gas, propane or fuel oil.

The Convex II has easy-to-operate linearized, motorized controls for accurately regulating the velocity of air flow directed at the product. These controls operate separately so air velocity above and below the band can be adjusted independently to help assure a completely uniform bake. (Food Engineering International. 3(6); 1978; 89)

50 Fully automated bakery equipment

The new all-in-one fully automatic bakery system can automatically proof, die stamp, fill, bake and depan a wide variety of sweet goods, rolls and better mixed products. Optional equipment for automatically loading, crumbling or topping can also be installed. Pan washing, rinsing, drying and oiling are done automatically as trays are returned to the front of the line. Throughout the process, no tray handling is re-

quired. A central control panel regulates the entire unit.

The multifoods machine features the unique flexibility of allowing bakers to proof and bake a variety of sizes and shapes of dough pieces in one operation. Proofing and baking are done in one pan mounted on a conveyorized carrier. Pans which normally add a sizeable amount to the investment of a new sweet goods line or even a roll line, are included in the purchase price. (Food Engineering International. 3(6); 1978; 81)

51 Pasteurising vats

A new range of heat treatment and pasteurising vats which are fitted with stainless steel steam heating coils instead of the conventional hot water jackets, have been introduced. The limpet coils are designed to operate with steam pressures of upto 15 psi so that higher working temperatures of the products (upto 100°C) can be reached much more quickly with less heat losses. The cooling cycle is also speeded up considerably. An outlet steam trap allows hot condensate to be returned to the boiler feed under pressure.

The new range of vats, which is additional to the water-jacketed models, is available in six standard capacities from 50 to 500 gallons, with special sizes upto 2,000 gallons, to provide for a wide variety of applications, such as dairy products, ice cream mixes, yoghurts for melting, etc. (Food Processing Industry. 47(558); 1978; 71)

52 Food warmer

Lifelong food warmer, is a glass-made printed-circuit appliance which eliminates electrical shocks, fuses or short circuits. It is recommended for keeping food warm in households, hotels, clubs and canteens. Three models are available. Each model can withstand a maximum weight of about 30 kg. The glass on top of the warmer is of about 5.5 mm thickness. Maximum surface temperature is roughly 110°C. The specially toughened glass used is not affected by spilled water or cooking medium,

is non-staining and meant for the dining table. There are no coils, no wiring and no elements inside. Any type of container (except those made of plastics) can be placed on top of the switched-on warmer for as long as necessary. (Industrial Products Finder. 7(1); 1978; 315)

53 Modified evaporator for tomato processing

Converting an existing double-effect evaporator into a triple-effect system has led to considerable savings in tomato processing plant. Output has been increased by 40% without changing water, steam and electric power consumption. (Food Engineering International. 3(7); 1978; 34)

54 Vacuum rotary paddle dryer

The vacuum rotary paddle dryer is for batch-drying of liquids as well as pasty and sandy material. The liquid to be removed can be water or any solvent. The rapid drying action does not damage the product and solvent recovery can be total. The dryer comprises a jacketed cylinder with a hollow shaft which carries the arms with paddles. The jacketed shell, arms and paddles are heated with steam, hot water or hot oil, and cooled with chilled water, brine or other refrigerants. Vacuum pump, dust filter, condensor and receiver are also supplied. At a heating temperature of 100°C, 15 kg of water per hour per m^2 of heating surface can be evaporated. To achieve this drying rate, the entire drying plant requires only about 1.5 kg of steam and 0.12 kWh of electrical energy per kg of evaporated water. The dryer incorporates scraper blades designed to clean the entire heating surface. There is a fine clearance between the paddles and the shell. A breaker bar can be provided to prevent the material from caking and to keep the heat transfer surfaces clear. It is particularly suitable when the product goes through a distinctly sticky phase during drying. A spring-loaded scraper may be supplied in case the product becomes extremely sticky during any stage of drying operation. A specially jacketed cylinder is provided if the heating medium is a

liquid like water or hot oil. The dryer is suitable for dyestuffs, pigments, plastics, plastic additives, agrochemicals, high purity products such as foodstuff and pharmaceuticals as well as organic and inorganic chemical substances. Five models are available with rated capacities of 500 to 6,000 litres. The charge per batch would be 40% of rated capacity. (Industrial Products Finder. 7(1); 1978; 53)

55 Solar drying of chillies

Regional Research Laboratory, Jammu has devised a Solar Drier for drying chillies. Red chillies of Kashmir are very popular, as these impart attractive bright red colour to the dishes. Chillies are produced in substantial quantity in Kashmir valley and it is a common scene to find chillies strung together by thread hung on walls and doors or spread on the rooftops. Commercially the plants with fruits still unplucked are harvested and spread out on the ground for about a week for partial drying. Thereafter, the fruits are plucked by hand and spread in the field for final drying. The entire operation takes about 15 days during which period chillies are exposed to dirt, dust, fungus attack besides uneven drying.

A solar drier has been made near Pampore which effects completely drying of the commodity in 4-5 days with a marked improvement in colour and storage characteristics. The gadget is very simple and is made of mud, stone, pebbles and glass panes only and is specially suited for the rural areas. It can be conveniently constructed by village artisans. A unit of 2.5 m x 2.5 m size costs Rs.325 and can dry 80 kg of chillies per batch. (RRL (Jammu) Newsletter. 5(5); 1978; 30)

56 Machine for ghee making

A very compact design of the continuous ghee making machine was completed and the trials were conducted successfully. 100 kg of ghee can be produced per hour from creamery butter in this prototype. Steam requirement is less than that in conventional pan method. (NDRI News-

letter. 8(4); 1978; 2)

57 Liquid plastic that resists fungus growth

Steridex, a water based liquid plastic that resists fungus growth, is being used by food plants such as cheese, milk, meat packaging and soft drinks, to combat the formation of mold on walls and ceilings. The plastic has a dirt resistant non-yellowing plastic skin atleast five times as thick as customary paint. (Food In Canada. 38(3); 1978; 56)

58 Flowmeter is versatile

Suitable for any liquid with a minimum conductivity of 1 µs/cm, this magnetic flowmeter can be used for measuring the flow of dairy products, foodstuffs or beverages. There is no pressure drop during metering and the measurement is not affected by temperature, pressure, density, viscosity or conductivity of the process medium. Accuracy is ± 0.5% of full scale.

Available in various sizes with bore diameters from 3 to 150 mm and nominal pressures upto 40 bar, the flowmeter has a standard output signal of 0 to 20 or 4 to 20 mA. The transmitter is of compact design and features low current consumption. It can be mounted in any position and has externally accessible electrodes for ease of replacement. (Food Engineering International. 3(6); 1978; 82)

59 Special switches solve confectionery problem

Special rotary switches to overcome problems arising from the sugar dust during the manufacture of chewing gum have been developed. Conventional switches failed because of sugar contamination of the contacts, but the new switches are fully encapsulated to withstand heavy external contamination. (Food Manufacture. 53(7); 1978; 79)

PACKAGING

60 Tin-free steel can for processed food

American Can Company is marketing its first tin-free steel (TFS) two-piece can for the processed food industry. Previously TFS production was limited to three-piece beer and beverage cans, using the Mira Seam process for cementing the side walls.

The new TFS can, in a 404 x 307 size offers several significant advantages over conventional three-piece soldered cans, including overall durability, lighter weight and the potential for lower production costs.

While normal start-up costs of the new production lines may cancel out any short-term cost advantages, over the long run tin-free steel will be a more economical raw material than tinplate or aluminium for making cans for processed foods.

Another advantage of the can is that the double-seamed bottom is eliminated by the two-piece construction, thus allowing for easier stacking in the supermarkets and a minimum of adjustment on the can lines in processing plants.

The TFS used in the process is first coated electrolytically with chrome, in much the same way that tin is deposited on steel to make tinplate. Once the cans have been formed, they are coated on the inside with enamel to prevent any interaction between the metal and the food contents. They are also coated on the outside with a clear lacque to prevent oxidation of the steel. (Food in Canada. 38(3); 1978; 14)

61 Vacuum can closer for meat products

All round rectangular and oval cans may be handled with this vacuum closer, specially designed for the meat industry. Cans between

45- and 150-mm height and 60 to 170 mm diameter can be closed at a rate of 20 to 60/min. Speed is infinitely variable.

A separate clinch station is provided to enable reliable processing of meat products such as corned beef. A lid-embossing station can also be added on request. A similar machine is available for low cost vacuum closing of cans from 45- to 105-mm height and 20- to 135-mm diameter. Maximum capacity of this low cost version is 75 cans/hour. (Food Engineering International. 3(7); 1978; 47)

62 Fills containers at high speeds

A variety of pumpable products such as margarine, lard, ice cream, yoghurt, viscous mixes and flavourings can be filled into containers to an accuracy of ± 0.25% by weight at speeds of upto 110/min with this tub filler. As standard, the machine accommodates ½ and 1 lb, 250- or 500-g containers.

Comprising container-dispenser, filling heads, and lidding mechanism, the machine can be fitted with automatic lid and tub stacking devices, if required. Both the container and lidding units are operated pneumatically and are interlocked with the main drive to the filling head cylinders. This gives a 'no container-no fill' safety feature. (Food Engineering International. 3(8); 1978; 35)

63 Improved carton sealer

This is an improved trigger operated carton sealer. This high grade all-weather poly packaging tape gives immediate adhesion to support full loads and shows significant savings over reinforced gummed tape and offers the same operational effectiveness and equal performance. The trigger dispenser allows minimal strips to be applied that will make the package stronger, will not cut it or scratch other packages. The tapes have all-weather properties. When applied to dry surfaces, they will withstand extremes of cold, heat and humidity. (Food in Canada. 38(3); 1978; 15)

64 Migration limits set for plastics

Proposals put forward by the EEC Commission last month set definite overall migration limits for plastics in contact with foodstuffs. They aim at making sure that by May 29, 1980 no plastics will impart more than 60 mg per kilo to foodstuffs.

Because of the difficulties involved in analysing migration levels in food products the Commission has chosen to propose conventional tests with liquids capable of simulating the attack of foodstuffs and reproducing the migration phenomena. It allows the loophole that if tests are found not to be sufficiently representative of reality, the individual governments may provisionally amend them until a community-level decision is taken.

The proposal will cover materials and articles consisting exclusively of a single type or a mixture of plastics, or comprising two or more layers of materials of which the inner layer is of plastics. Specifically excluded are regenerated cellulose film elastomer materials and also natural and synthetic rubbers; surface coatings like varnishes, lacquers and dispersions (applied as liquids, but not as melts) adhesives; and paper and paperboard impregnated with plastic materials.

The basic limits of migration are set at either 60 mg a kilo or litre, depending on whether the product is a liquid or solid. However, the value is set at 10 mg/dm^2 of the surface in contact with the foodstuff for containers of less than 250 ml capacity or of sheets, foils and other non-fillable articles for which the ratio of surface area and quantity of foodstuffs in contact cannot be calculated, (Packaging News. July 1978; 3)

65 Plastic crate cleaner

A plastic crate and case washing machine has been developed by ultrasonic cleaning. It works on the ultrasonic principle: objects to be cleaned are totally immersed in a hot detergent and submitted to ultrasonic vibratory energy, which removes surface soil including the

tenacious grey film commonly referred to as static soiling. The machine is fabricated from steel, thermally insulated with expanded polystyrene and clad with painted mild steel or GRP panels in dark blue. Although designed to clean plastics, the machine has proved itself in laboratory testing to clean various metal containers to a previously unobtainable degree in about one-sixth of the normal time. Handles crates up to 475 x 375 x 280 mm in size at a rate of up to 1,500/h. (Food Manufacture. 53(7); 1978; 75)

ANALYSIS

66 Determination of hairs and feathers in cereal products

A rapid combined method for hydrolysis and staining, using only one reaction vessel for the determination of hairs, feathers, insects and similar detritus in cereal products, is described. Problems associated with the selection of a distinctive staining agent are discussed, and the choice of remazol brilliant blue is explained with reference to the modified keratin confirmatory test applied to starch containing products. The mechanism of this test is explained, and experimental results are evaluated. (Food Manufacture. 53(8); 1978; 61)

67 Kit for microbial contamination

A disposable dip-test device permits personnel without microbiological training to determine the level of microbial contamination in products and ingredients. These kits give easy and quick results equal in accuracy to those of conventional pour plating.

Basic kit includes samplers and complete dilution kit. For testing solids, an additional filtration system provides means to sterilize suspension medium and suspend sample in one operation. (Food Product Development. 12(4); 1978; 82)

68 Electronic measurement of bacterial growth

Currently practised procedure of dilution and growing in medium for assessing the population of bacteria is tedious and time-consuming (lasting several days), and owing to poor reliability, the analysis must be carried out on several replicates to get sufficient accuracy.

An improved and accurate method, based on the previous electrical impedance method (bacterial sensitivity $10^3/mm^3$), with a sensitivity to detect 1 bacterial division/mm^3 and a simultaneous batch processing capacity of two samples has been worked out at the University of Aberdeen and Torry Research Station, Aberdeen (U.K). The method provides a reliable measurement of bacterial population. In particular, two instruments have been devised: one measures ac-conductance changes in 4-5 sample directly on a chart recorder and the other can handle up to 128 samples at a time and feeds the data to a digital computer for processing to obtain bacteriological parameters like mean generation time, lag time, inoculum number, etc. from conductivity measurements. Another advantage is that the sample cell is so designed that it needs no replacement, as in the case of earlier methods. The sensitivity of detection of bacterial growth has been found to be 50 mm^{-3}. This is considerably more than a 5% sensitivity possible in the viable counting method. (Journal of Scientific and Industrial Research. 37(10); 1978; 562)

69 Grain-quality analyzer

This grain-quality analyzer permits direct protein calibration of wheat from just two samples. Benefits include the elimination of particle size as a critical factor to accurate results, protein readings and calibrations independent of growing area, and the sampling of 'wet' or 'dry' samples without influencing computations. (Food Engineering International 3(6): 1978; 86)

70 Determination of starch content in meat products

A semi-automatic enzymatic determination of the starch content

meat products has been worked out. The procedure entails the measurement of the glucose content of a perchloric acid hydrolysate of the sample. The glucose determination in the hydrolysate can be done enzymatically via oxidation of the glucose catalysed by glucose hydrogenase using the NAD^+ coenzyme mixture. Neutralization of the hydrolytic acid, the addition of a protein precipitating agent and intermediate dilution of the hydrolysate can be dispensed with this new method. The technique provides simple, rapid and specific determination of glucose and the operation can be easily automated. (Food Manufacture. 53(7); 1978; 23)

71 Refractometer for juice products

A refractometer for juice products is said to eliminate the need for water baths, thermometers and to reduce human error. The unit ~~requ~~ requires no correction tables to read or scales to interpret and it has temperature compensation, which allows for various room temperature and sampling of hot or cold products. (Processed Prepared Food. 147(8); 1978; 116)

72 Nitrite test controls curing process

The Rapid Nitrite Analyzer, used with a modification of the standard AOAC colorimetric method, brings nitrite determination to the production floor as a process control tool. By accelerating established diazo-coupling reactions, it is made possible for the quantitation of nitrite in pickle solutions in less than 15 minutes and meat products in 1½ hours.

Personnel with minimal experience can measure nitrite with accuracy of ±1 per cent. A sample is weighed, diluted to standard volume, and mixed with color-developing reagents. At a specified time, color intensity is measured by the Analyzer, then equivalent ppm of nitrite is read from a chart. (Food Product Development. 12(2); 1978; 24)

ECONOMIC & COMMERCIAL STATISTICS

73 Availability of foodgrains in India

(Thousand tonnes unless otherwise stated)

Year	Population (Thousand persons)	Production		Net imports	Net availability	Per capita net availability	
		Gross	Net			Kg per year	Gm per day
			Rice				
1976	6,13,273	48,740	45,036	79	42,228	68.8	188.0
1977(P)	6,25,818	42,788	39,536	(-)17	39,537	63.2	173.2
			Wheat				
1976	6,13,273	28,846	25,356	5,832	23,779	38.8	106.0
1977(P)	6,25,818	29,082	25,563	411	26,824	42.9	117.5
			Other Cereals (Other than rice and wheat)				
1976	6,13,273	30,409	24,104	529	24,302	39.6	108.2
1977(P)	6,25,818	28,492	22,718	...	23,321	37.2	101.9
			Cereals				
1976	6,13,273	1,07,995	94,496	6,440	90,309	147.2	402.2
1977(P)	6,25,818	1,00,362	87,817	394	89,682	143.3	392.6
			Gram				
1976	6,13,273	5,879	4,581	(-)2	4,579	7.5	20.5
1977(P)	6,25,818	5,366	4,180	(-)1	4,179	6.7	18.4
			Pulses				
1976	6,13,273	13,039	11,409	(-)5	11,404	18.6	50.8
1977(P)	6,25,818	11,208	9,807	(-)1	9,806	15.7	43.0
			Foodgrains				
1976	6,13,273	1,21,034	1,05,905	6,435	1,01,713	165.8	453.0
1977(P)	6,25,818	1,11,570	97,624	393	99,488	159.0	435.6

(P)-Provisional and subject to revision.

1 kg. per year = 2.74 grams per day.

NOTES.-1. Population figures are based on the latest projections made by the Expert Committee.

2. Net production has been taken as 87.5 per cent of gross production in respect of cereals and pulses; the percentages used in respect of rice, wheat and gram are 92.4, 87.9 and 77.9 respectively, balance being provided for feed, seed requirements and wastage.

3. Figures relating to net imports have been arrived at by deducting gross imports.

4. The estimate of net availability are calculated as: Net production + net imports - (±) change in government stocks.

5. Figures in respect of per capita availability given above are not strictly representative of the actual level of consumption in the country, especially as they do not take into account any change in stocks in possession of traders, producers and consumers.

(Agricultural Situation in India. 33(3); 1978; 183)

74 Groundnut production in India

All-India Final Estimates of Groundnut, 1977-78

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	1,066.0	974.7
Bihar	8.7	8.2
Gujarat	1,954.2	1,723.1
Haryana	8.1	9.6
Himachal Pradesh	1.8	1.9
Karnataka	944.0	648.9
Kerala	26.7	28.0
Madhya Pradesh	509.4	290.7
Maharashtra	848.3	578.4
Orissa	104.0	117.3
Punjab	156.0	154.0
Rajasthan	243.5	174.1
Tamil Nadu	975.0	1,110.5

(contd...

Tripura	0.4	0.4
Uttar Pradesh	326.3	244.7
All India	7,174.8	6,068.5

(The Oils and Oilseeds Journal. 31(1); 1978; 41)

75 Safflower production in India

All-India Final Estimate of Safflower, 1977-78

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	20.1	5.0
Bihar	0.5*	0.2*
Karnataka	163.3	38.0
Madhya Pradesh	0.8	0.2
Maharashtra	515.0	142.2
Orissa	1.5*	0.7*
All India	701.2	186.3

*- Last year's data repeated for want of information for 1977-78

NOTES:

1. Safflower is not grown to any appreciable extent in other States/Union Territorics not mentioned above.
2. No information regarding crop estimates is yet available from the Government of Sikkim.

(The Oils and Oilseeds Journal. 31(1); 1978; 40)

76 Production of Nigerseed in India

All India Final Estimate of Nigerseed, 1977-78

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	12.9	11.7
Bihar	52.6	20.7
Karnataka	45.1	8.4
Madhya Pradesh	261.0	46.7
Maharashtra	107.7	12.9
Orissa	110.3	39.1
Dadra & Nagar Haveli	0.4	0.1
All-India	590.0	139.6

NOTES:

1. Nigerseed crop is not grown to any appreciable extent in other States and Union Territories not mentioned above.
2. No information regarding crop estimates is yet available from the Government of Sikkim.

(The Oils and Oilseeds Journal. 31(1); 1978; 40)

77 Production of Sesamum in India

All India Final Estimate of Sesamum (Til or Gingelly), 1977-78

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	149.0	25.9*
Assam	10.9	5.3
Bihar	21.0	5.1
Gujarat	110.1	23.3*
Haryana	3.4	1.8
Himachal Pradesh	8.2+	2.0+
Jammu and Kashmir	5.3+	1.1+
Karnataka	99.0	38.3*

(contd...

Kerala	16.3	4.3
Madhya Pradesh‡	262.7	45.5*
Maharashtra	175.1	44.2
Manipur	2.3+	1.1+
Meghalaya	0.5	0.3
Nagaland	0.7	0.3
Orissa	145.0	60.8
Punjab	13.1	11.4
Rajasthan	363.1	50.1*
Tamil Nadu	118.9	39.2
Tripura	2.6+	0.8+
Uttar Pradesh	-	-
Pure	57.2	7.9*
Mixed	707.0	95.6
Total	764.2	103.5
West Bengal	33.4+	21.4+
Pondicherry	0.7	0.3
All-India	2,305.5	486.0

* Based on the results of crop estimation surveys.

+ Last year's data repeated.

‡ Includes area of 900 hectares and Production figure of 200 tons for 1977-78 and 1976-77 for the crop grown in non-reporting (forest) areas of Madhya Pradesh.

NOTES:

1. Sesamum is not grown to any appreciable extent in other States/Union Territories not mentioned above.
2. No information regarding crop estimates is yet available from the Government of Sikkim.

(The Oils and Oilseeds Journal. 31(1); 1978; 42)

78 Cashew production

State-wise area and production of cashew in India* in 1976-77

State	Area (hectares)	Production (tons)
Andhra Pradesh	25,100***	12,500
Kerala	1,18,139	1,29,021
Karnataka	36,534	15,175
Maharashtra	79,808**	3,634
Orissa	24,487*	940
Tamil Nadu	97,130	11,470
Goa	32,517*	6,500*
Pondicherry	322	42
Tripura	753*	23
West Bengal	2,506*	Neg
T o t a l:	4,17,296	1,79,305

*Earlier year's figures are repeated.

**Including an area of 49,961 hectares brought under cashew under Land Development-cum-Horticulture Development Scheme.

***Indicates bearing area only. Total area has been called for. After getting this, area estimates will have to be revised upwards.

NOTE: Area and production figures are as reported by the State Governments. They are purely tentative and provisional and liable to be revised.

(Cashew Newsteller. 12(1-3); 1978; 25)

79 Area and Production of Black Pepper

State/District	Area (Hectares)	Production (Tonnes)
Karnataka		
Belgaum	5	1
Chickmagalur	55	6
Hassan	34	4
Uttara Kannada	896	229
Shimoga	215	65
Dakshina Kannada	490	121
Kodagu	1,804	559
Other Districts	-	-
T o t a l:	3,499	985
Kerala		
Trivandrum	5,856	1,780
Quilon	9,628	3,456
Alleppey	5,231	999
Kottayam	12,938	2,199
Ernakulam	6,304	1,652
Trichur	1,678	458
Palghat	851	225
Malappuram	6,049	1,748
Kozhikode	19,658	7,922
Cannanore	32,081	8,983
Idikki	9,882	1,354
T o t a l:	1,10,156	30,776
Tamil Nadu		
The Nilgiris	200	40
Kanniya Kumari	80	20
Other Districts	-	-
T o t a l:	280	60
Pondicherry	12	4

- Nil or Negligible
Note: The crop is not grown to any appreciable extent in States/Territories/Districts not mentioned above.

(Agricultural Situation in India. 33(3); 1978; 190)

80 Poultry production in India

Poultry production in the country has made a substantial progress during the recent past. The annual production during 1977-78 touched 10,000 million eggs as against 7,700 million eggs during 1973-74. The target for 1982-83 is 16,000 million eggs.

Scientific poultry breeding programmes were intensified last year at the three Central Poultry Breeding Farms located at Hessarghatta (Bangalore), Bombay and Bhubaneshwar. A cross hybrid strain has been developed at Hessarghatta Farm, which has the potential to lay upto 260 eggs in 12 months production period. The laying performance of this hybrid compares favourably with the hybrid has been released to the industry under the brand name HH 260. (Economic and Commercial News. 7(49); 1978; 12)

81 Augmenting milk production

The tentative target proposed for milk production during the sixth plan is 35.5 million tonnes as against the estimated production of 27.8 million tonnes in 1977-78. The achievements of the operation Flood-I Programme have been reviewed to ensure effective implementation of Operation Flood II Project, whose implementation has been taken in hand.

The achievement of the Operation Flood-I Programme so far are: (i) increase of the milk processing capacities in the dairies of metropolitan cities of Bombay, Calcutta, Delhi and Madras to 2.5 million litres of milk per day as against the target of 2.75 million litres daily. Throughput of milk in these dairies having increased to 1.9 million litres per day as against 0.9 million litres in the pre-project period; (ii) 17 feeder balancing dairy plants in rural areas on Anand pattern have been established or expanded; (iii) over 900,000 milk producers have been enrolled as members of milk cooperative societies. Further 7,000 cooperative societies have been registered on Anand pattern; (iv) over 2,300 artificial insemination sub-centres have been established

and over 1.1 million insemination have been carried out; and (iv) 14 bull mother-farms have been established in the project areas for production of genetic materials for the cross-breeding programmes. The total expenditure under the project has been Rs.698.30 million. (Economic and Commercial News. 7(52); 1978; 12)

82 Expenditure on science and technology

India spent Rs.4,480 million in 1976-77 on research and development (R&D). Atomic energy research accounted for 23% of the total expenditure followed by defence research (21%). The shares of other sectors were: Council of Scientific and Industrial Research (17%), Space Research (16%), Agricultural Research (15%) and Medical Research and Electronics (2%). (Data India. 52; 1978; 827)

83 Production of edible oils and oilcakes in India

(in lakh tonnes)

Year	Oils	Oilcakes
1976-77	23.60	32.41
1977-78	24.50	N.A.

(The Oils and Oilseeds Journal. 31(1); 1978; 42)

84 Production of vanaspati in India

Year	Quantity (tonnes)
1977	5,80,000
1978 (Estimated)	6,50,000

(The Oils and Oilseeds Journal. 31(1); 1978; 42)

85 Sugar production and consumption

The actual domestic consumption of sugar reached 4.49 million tonnes level, registering an increase of nearly 20 percent, over the previous year's consumption of only around 3,753 million tonnes.

The capacity utilisation in the sugar industry ranged from about 89 to 116 percent during the last six seasons, which compared favourably with the general industrial scene in the country. (Economic and Commercial News. 7(50); 1978; 11)

86 Exports and imports of oilseeds and oils

Commodity	April to March 1977	
	Quantity (thousand tonnes)	Value (Rs in Lakhs)
EXPORTS		
Oilseeds		
H.P.S. groundnut kernel	122.81	5,939.54
H.P.S. groundnut with shell	413.73	584.61
Niger seed	9.44	246.69
Safflower seed	2.55	38.54
Sesamum seed	4.46	185.28
Vegetable oils		
Groundnut oil	3.40	196.51
Mustard oil	0.08	4.46
Linseed oil	42.09	1,843.91
Castor oil	40.96	2,202.40
Coconut oil	0.01	0.34
IMPORTS		
Copra	5.08	157.37
Linseed	4.73	105.02
Mustard seed	3.06	65.02
Sesamum seed	0.03	0.92
Oils		
Soyabean oil	87.95	5,115.78
Groundnut oil	18.30	2,010.94
Linseed oil	6.63	37.15
Mustard oil	22.29	1,109.44
Palm oil	39.97	1,744.71
Coconut oil	0.15	9.71

(Agricultural Situation in India. 33(3); 1978; 177)

87 Export and import of cashew kernels from India

Period of ending	Export of kernels Quantity (tons)	Value (Rs Lakhs)	Import of rawnuts Quantity (tons)	Value (Rs Lakhs)
1975-76	53,640	9,613	1,37,196	3,356
1976-77	51,565	10,599	74,131	1,808
1977-78*	39,111	14,761	60,194	1,872

*Provisional

(Cashew Newsteller. 12(1-3); 1978; 23)

88 ECGC's new schemes for exporters

The Export Credit and Guarantee Corporation Limited (ECGC) has introduced the following three schemes for the benefit of exporters. (1) Investment insurance guarantee; (2) special scheme for small scale exporters; and (3) whole turnover post-shipment export credit guarantee.

The salient features of the investment guarantee scheme are:

i) All companies and individuals carrying on business in India and their overseas subsidiaries are in principle eligible for insurance. The basic principle is that the investment should be Indian in the host country and benefit shall accrue to India.

ii) Investment in any country approved for the purpose is eligible for investment insurance subject to prior clearance.

iii) Investment may be made by way of equity or loans granted to overseas enterprises by the investor or his associates. It may be made by either as cash remittance or by way of export of capital goods or services. The Corporation may at its discretion cover investment/loans already made/ extended on a selective basis. If increased investment

is out of the retained profits/interest, cover will be available subject to an investment not being more than 50 percent of amount, originally invested.

iv) Cover shall extend to 100 percent of the value of investment for the first 10 years and shall be reduced thereafter year by year till the 15th year when the cover shall extend to 50 percent of the value of the investment. The maximum amount of insurance will be 150 percent of the original investment inclusive of profits plus dividends and/or interest and fresh equity.

v) The duration of insurance cover shall not normally exceed 15 years. In case of projects involving a long period of construction, cover could be considered in deserving cases for a period of 15 years from the date of completion of the project subject to a maximum of 20 years from the date of commencement of the investment.

vi) Risks of war, expropriation, restriction or remittances and such other risks as may be considered necessary, with the approval of the Government will be covered. The commercial risks of the investment are not covered.

vii) The percentage of cover is based on the principle of risk sharing. In the case of total loss of the investment from the occurrence of any insured risks, ECGC will cover 90 percent of the loss of the current equity investment. Current equity briefly means the original investment less any redemption or reduction of capital plus any retained profits less any commercial losses and loans. It shall be open for the Corporation to restrict the percentage of cover at the time of annual renewal of the guarantee.

viii) The insurance premium will be at the rate of 1 percent per annum which is payable in advance for each year. In addition, a fee of 0.1 percent of the amount to be insured subject to a maximum of Rs.25,000/- is to be paid along with each application, which is adjusted towards the insurance

premium payable when the Corporation agrees to cover the investment.

ix) In case the application for investment is rejected, 50 percent of the fee paid shall be refunded.

As regards special schemes for small scale exporters, the following will be the concessions:

i) It is proposed to restrict the scheme to an exporter whose annual export turnover including letters of credit transactions is not more than Rs.1 million and his total turnover including export does not exceed Rs.2.5 million.

ii) The following agencies who may exceed the aforesaid prescribed financial limits would be treated on par with small scale exporters:

(a) Co-operatives or artisans,

(b) Co-operatives or association or consortia of small scale industries,

(c) Handloom and Handicrafts export promotion or State export Corporations,

(d) State small scale industries corporation, and

(e) NSIC.

iii) Insurance policies: The cover will be 95 percent for commercial risks and 100 percent for political risks provided the maximum liability under the policy does not exceed Rs.0.5 million special cases, relaxation would be considered.

iv) Packing credit guarantee: The cover will be extended to 90 percent for small scale exporters whether manufacturers or merchant exporters.

v) Several other concessions have been laid down for processing claims of small scale exporters even in the event of their failure to fulfil certain basic obligations under the policy, provided the Corporation is satisfied about the bonafides of the transactions.

vi) Furthermore, the process of settlement of claims will be

expedited in case of small scale exporters. Transfer claims would be paid within 2 months instead of the usual period of four months.

The main features of the whole turnover post-shipment export credit guarantee are as under:

i) The guarantee can be issued to banks whether exporters holds ECCC policy or not.

ii) The cover would be 85 percent in case of exporters holding ECGC policy and 60 percent in case of exporters who do not hold ECGC policy.

iii) The cover would be 90 percent and 65 percent for small scale exporters who hold ECGC policy and who do not hold ECGC policy respectively.

iv) The banks will be permitted to fix limits upto a certain amount on each exporter and beyond that limit they have to seek ECGC's approval.

v) Banks have option to cover L/C advances. If they opt for L/C advances, they have to cover all L/C's.

vi) The rate of premium will be 2.5 paise per Rs.100/- per month payable in case banks not opt to cover only non-L/C advances and 2.0 paise per Rs.100 per month in case all post-shipment advances including L/C's covered. Declarations will be submitted as under whole turnover packing credit guarantee.

vii) Banks can alter the terms of the bill and extend the due date in their discretion and according to their best judgement upto 180 days. If the period is to be extended beyond 180 days prior approval of ECGC would be necessary.

(Economic and Commercial News. 7(45); 1978; 7-8)

89 Mandatory air freight rates for spices

The Government of India, Ministry of Tourism and Civil Aviation

have issued notification dated 13th November 1978 advising the Air India to apply a mandatory rate of Rs.6.30 per kg for air freighting shipments of foodstuffs, spices and beverages from Delhi/Bombay for various specific destinations provided the weight of each shipment is 250 kg or above. The destinations are Dubai, Muscat, Abu Dhabi, Kuwait, Baghdad, Bahrain, Jeddah, Dhahran and Doha. (Cardamom. 10(6); 1978; 46)

FOOD LEGISLATION, QUALITY CONTROL AND HYGIENE

90 Acrylonitrile banned from beverage containers

Food Technology reports that in the USA acrylonitrile copolymers will no longer be allowed in the manufacture of beverage containers because residual acrylonitrile monomer migrates from the bottle well into the contents of the bottle at levels that are not considered safe. The FDA has stated that a safe level of human consumption cannot be determined because of the inadequacy of the data available and the probable carcinogenicity of acrylonitrile. Details are in the Federal Register of 23 September 1977. (Food Technology in Australia. 30(4); 1978; 131)

91 Red No.40 still under study

A second interim report on the coloring agent Red No.40 has been tabled by a special Working Group of the U.S. Food and Drug Administration. The report indicates that current available data does not show this coloring agent to be carcinogenic. However, it was also recommended that final assessment of the coloring should not be made until a second mouse study begun in 1976 and still underway is completed. (Food in Canada. 38(6); 1978; 12)

92 Cardiovascular studies in rapeseed and mustard seed oil eating population

Mustard and rapeseed oils are consumed in large quantities in Bengal and Bihar. These oils are rich in erucic acid. A study was undertaken to find out the potential danger of development of heart fibrosis due to erucic acid in population accustomed to consume the above oils.

The heart samples examined showed erucic acid from 1 to 10% in population eating the above oils. But there was no histological evidence of development of fibrosis ascribable to the consumption of mustard oil. In great majority of hearts about 5% erucic acid was noted. The results of these studies may therefore be taken as indicating that at levels of intake of mustard oil generally seen in population groups the risk of developing myocardial fibrosis is low. (ICMR Bulletin. 8(2); 1978; 7-8)

93 Data bank on viruses in food

The WHO Food Virology Programme maintains a data bank on viruses in foods and the effect of food-borne viruses on public health. Reports in the collection concern:

(a) Properties of viruses that affect their transmissibility;
(b) instances of virus occurrence in foods, as evidenced by laboratory detection of the virus or by an outbreak of human disease;
(c) other evidence of virus occurrence in foods;
(d) methods of detecting food-borne viruses; and
(e) studies of virus stability or inactivation in foods.

Each report is based on one or more sources of information (usually journal articles) from all over the world and has been prepared by a laboratory virologist.

The retrieval system provides precise information on specific subjects and it is aimed to serve food control authorities, epidemiologists dealing with food-borne disease outbreaks, research and laboratory workers in the field of food hygiene, and research programme

planners. In order that information may be given as promptly and precisely as possible, users of the system will be supplied with 'Request for Information' forms which direct questions in a way that is compatible with the retrieval system. These forms and additional information on the programme may be obtained from Veterinary Public Health, Division of Communicable Diseases, World Health Organization, 1211 Geneva 27, Switzerland. (Institute of Food Science & Technology (U.K) Proceedings. 11(1); 1978; 61)

94 Directory of testing facilities

The Indian National Scientific Documentation Centre (INSDOC), New Delhi, has taken up the compilation of a 'Directory of Testing Facilities in India' under the National Information System for Science and Technology (NISSAT) scheme of the Department of Science and Technology. The Directory will cover facilities relating to the testing of agricultural and food products, chemicals, drugs and pharmaceuticals, instruments and appliances, materials, physical and engineering metrology, testiles, electrical engineering, electronics, etc. Institutions and organizations which have such facilities, even if meant for in-house use only, may send particulars in this regard in conformity with the questionnaire designed for the purpose. Copies of the questionnaire may be obtained, on request, from the Scientist-in-Charge, INSDOC, Hillside Road, New Delhi-110 012. (Research and Industry. 23(2); 1978; 116)

95 Spicy foods cure bronchitis

Tobasco sauce and horseradish may do wonders for bronchitis. Spicy foods are particularly good for helping clear up respiratory problems. In Los Angeles, the Mexican members of the population who go in for hot spice food have far less bronchitis than the non-Mexicans who do not tend to eat such food. Oysters served with horseradish or spiced shrimp or dishes laced with tobasco sauce or highly seasoned gumbo clear sinuses, nose, and may help to clear lungs. Bronchitis

sufferers can sprinkle 20 drops of tobasco sauce into a glass of water and use it as a gargle. (Science Reporter. 15(11); 1978 767)

96 Detergent/disinfectant is for food industries

Developed for use in food and beverage processing plants. Weladyne-FB is an iodophor combining the disinfectant action of iodine with the wetting and cleaning properties of synthetic, non-ionic surface-active agents and phosphoric acid. In many applications, its combined action enables both cleaning and disinfection to be achieved in one operation.

The product is available in 5- and 25- liter containers. It can be used for treating processing equipment, food preparation areas such as table tops, food storage coldrooms and refrigerated transport units. (Food Engineering International. 3(8); 1978; 36)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

97 US know-how for oilseed processing units

The Co-operative League of the US (CLUSA) will assist co-operative oilseeds processing units in India in improving their management and technological efficiency. This assistance will be made available through the services of three consultants to be located with the National Co-operative Development Corporation (NCDC).

The collaborating agencies have drawn up a detailed project for development and testing of modern management techniques, technological efficiency and training programme including preparation of manuals and materials for the oilseed processing units as well as organising a number of workshops and seminars [illegible] management.

CLUSA experts in management and oilseed technology will work in the processing plants for introducing new management systems to improve their efficiency. NCDC will also employ three counterpart consultants so that after the management consultants le ve, they can carry on with the consultancy.

CLUSA will provide an assistance of $4,75,000 (about Rs.38 lakhs) for this project which will last two years. NCDC has, so far, given financial assistance amounting to Rs.200 million for setting up 40 large-sized co-operative oilseed processing complexes comprising oil mills, solvent extraction plants, refineries and vanaspati units all over the country.

The processing units are based on a variety of raw materials including groundnut and cottonseed. Many units are in the initial stages of operation and it is envisaged that their all-round efficiency will improve substantially through the technical and management assistance being provided under this project. (The Oils and Oilseeds Journal. 31(1); 1978; 38)

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STORAGE

98 Non-Chemical insect control

Insectocutor is an effective method of non-chemical control of flying insects like houseflies, fruit flies, flying beetles, moths, mosquitoes and other insects. It is recommended for canteens, canning factories, bottling plants, food processing units, slaughter houses, sugar factories, bone processing units, pharmaceutical plants, hospitals, tanneries, fisheries, kitchens, bakeries, restaurants, poultry farms, stables, sweetmeat shops, airports, super markets, clubs, as well as TV and film studios. The electronically operated device is a practical, efficient and hygienic insect control equipment intended as a permanent installation for continuous operation. It posses no danger of pollution, no risk of toxicity and no short or long term hazards. The insects develop no immunity against this instrument since no chemical mode of control is involved. The device consists of ultraviolet flourescent tubes to attract flying insects which are then trapped and electrocuted in an electric grid. The lamps used are specifically meant for attracting flying insects and are safe to human eyes. Current in the grid is insufficient to seriously harm a human being (Industrial Products Finder. 7(8); 1979; 40)

FOOD ADDITIVES

99 Cocoa butter substitute okayed by FDA

Cocoa butter substitute from palm oil received GRAS affirmation as a direct food substance in a November 21 FDA action.

FDA feels the *c/u name established, "cocoa butter substitute from palm oil," has the advantage of "both identifying the basic nature of the ingredient and ... the source of the starting material."

The ingredient has a similar chemical composition to natural cocoa butter: 26% palmitic acid in natural cocoa butter compared to 20% in the ingredient; 35% oleic acid compared to 32% in the ingredient; 3% linoleic acid compared to 2% in the ingredient; 34% stearic acid compared to 44% in the ingredient.

In a related action on Nov.21, FDA approved use of trifluoromethane sulfonic acid in the manufacture of cocoa butter substitute from palm oil (Food Product development. 13(1); 1979; 8)

(*c/u = common/usual)

100 Potassium sorbate in bacon products

The tests showed that 0.26-percent potassium sorbate together with 40 parts per million nitrite in bacon provided antibotulinal protection equal to or better than 120 parts per million of nitrite. Fried bacon containing 40 parts per million nitrite and 0.26 percent potassium sorbate was found to contain less than five parts per billion volatile nitrosamines. (Processed Prepared Food. 147(8); 1978; 102)

101 Fruit concentrate preserves baked goods

Raisin juice concentrate is currently used in more than 50 different variety breads in the U.S. and is recommended for most dark baked goods. Depending on the formula and climatic conditions, products containing 5 to 10% concentrate remain fresh two to three days longer than the same breads without concentrate. (Food Product Development. 13(1); 1979; 34)

102 New source for xanthan gum

A food-grade xanthan gum is produced by the pure culture fermentation of the microorganism, Xanthomonas campestris. This new biopolymer is a high molecular weight polysaccharide suitable for food processing and applicable in syrups, spoonable dressings, sauces and gravies, relishes, pourable dressings, juice drinks, frozen foods, dry mixes, canned foods and more. Xanthan gum is resistant to extremes of acidity and to high temperatures. This gum is particularly useful as an aid to thickening, suspending, emulsifying and stabilizing water-based systems. (Processed Prepared Food. 147(8); 1978; 79)

103 Gum acacia blend for encapsulating

Emulgum, a synergistic blend of gum acacias for applications in emulsification, encapsulation and stabilization of foods and beverages has been developed.

The suggested applications include: stabilizing cloud emulsions prepared with vegetable fats or oil-soluble gum resins; emulsion concentrates for beverages:; encapsulation and spray drying of flavors, vitamins, colors; stabilization of other selected emulsions.

The principal advantage of Emulgum is that its molecular structure, capable of trapping two-to-three times its own weight in essential oils, permits substantially lower use levels for effective stabilization. Besides the economic advantages, Emulgum permits longer shelf life for spray dried flavors, is tasteless and odorless in finished products and exhibits three-to-five times the effectiveness in the stabilization of beverages. (Processed Prepared Food. 147(9); 1978; 102)

104 Molasses product reduces hamburger shrinkage

Dri-Mol 604 dehydrated molasses product reduces shrinkage and improves flavor, juiciness, and texture of hamburger when added to any ground meat recipe. As little as 2.5% provides more moisture retention,

producing fried grilled hamburgers which are more juicy. Meats also have a more tender texture, good mouth feel and pleasing "sweet meat" flavor. At 3% applications levels, Dri-Mol 604 reduces shrinkage by 6.38%. Since cost of this ingredient application adds less than 4C to the total cost of a quarterpound hamburger, significant savings are obtained. (Food Product Development. 12(10); 1978; 46)

105 A new emulsifier

Powder plus represents a new and improved beaded blend of succinylated monoglycerides and distilled monoglycerides prepared from edible hydrogenated animal fat. Emulsifier is produced by a new concept in beading technology which incorporates into the product the advantages of both powders (easy to handle) and hydrated products. Thus, the product disperses instantly in cold water with minimal agitation and remains in suspension. Powder plus softener/conditioner is effective in conventional or continuous mix baked goods, providing excellent softness and shelf life over extended four to five day periods. (Food Product development. 12(10); 1978; 44)

106 Emulsifier from soy protein

Nutrisoy 101 a specially processed emulsifier and nondairy base made from soy protein. In pourable and spoonable salad dressings, the ingredient permits a 50% reduction in oil concentration without adversely affecting product appearance, consistency, or organoleptic properties. Caloric content also is reduced by 40 to 50% and ingredient cost lowered significantly. By incorporating Nutrisoy into salad dressing type formulations, manufacturers eliminate the need for egg solids, while increasing the protein level. Additional ingredient applications include use as a nutritious beverage or as a replacer/extender of dairy proteins in soups, sauces, and baked goods. (Food Product development. 12(10); 1978; 42)

107 Chicken-type flavor

Spectra-CBH is a flavor designed for use in a wide variety of

products, dry mixes, wet systems and retort systems to provide a produc with a flavor similar to that imparted by freshly-cooked chicken meat. The product may also have application in such seafood products as clam chowder. Or it may be used at low levels to round out the flavor of a tomato soup.

The usage level of this ingredient ranges from 0.3 to 0.5 per ce as consumed, considerably lower than the usage level of hydrolyzed plan protein. Spectra-CBH is composed of 100-percent flavor solids and is not dried on any carrier. It is also priced competitively against artificial meat-type flavors currently on the market. (Processed Prepared Food. 147(6); 1978; 50)

108 Masking flavors used at low levels

Masking flavors help cover flavors and aromas produced by amino acid combinations in protein products and assist in keeping the products acceptable to consumers. Masking flavors are used at very low levels and are offered along with flavors for meat analogs including beef, chicken or pork types. The masking flavors cover off-flavors without imparting characterizing flavors of their own, permitting the free use of other flavors in these products. Information about the natural and artificial masking flavors in liquid or powdered form, is available. (Processed Prepared Food. 147(8); 1978; 86)

PROCESSES

109 Alcohol from cane juice

The government is considering the technical feasibility and economic viability of producing power alcohol directly from sugarcane juice as is being done in Brazil.

However, on present indications, the cost-price structure would be somewhat unfavourable under the Indian conditions.

According to the present cost-price structure of sugarcane and molasses, the bare cost of power alcohol, if produced directly from cane juice, would come to about Rs.3.50 per litre as against 68 paise per litre via the molasses stream. (Indian Sugar. 28(9); 1978; 599)

110 New process for removing SO_2 from grape juice

Unfermented grape juice-or sweetener reserve as wine makers call it-is added in limited amounts to wine prior to bottling. It is difficult to preserve the sweetener reserve so as to prevent fermentation during storage. They deteriorate the wine's taste. Sulphur is therefore commonly used.

But sulphur brings in a new difficulty. How to remove excess sulphur dioxide (SO_2) before adding the sweetener reserve to the wine. Excess SO_2 is prohibited by law in most wine-producing countries. Several methods have been devised in the past for removing excess SO_2, but all have proved unpractical or uneconomical.

Wine makers can now solve this problem with the aid of a new continuous process.

Entirely thermal in effect, the process requires no inert carrier gases such as nitrogen or any other auxiliary medium. Only vapors originating from the product itself are used. Desulphurization efficiency is so high that excess SO_2 is reduced from 2000 mg/1 before treatment to less than 100 mg/1 after treatment. There is no oxidation, and potassium sulfate content remains constant. (Food Engineering. 3(10); 1978; 74)

111 Breakthrough in spray-drying improves quality, shelf-life

Fruit and vegetable powders can now be produced with the taste, colour and vitamins of the original, natural product. The key to this unique development is the application of low temperatures of 40° to 50°C to spray-drying. (Food Engineering. 3(4); 1978; 48)

112 Crab analog from wheat gluten

Japan has developed a process to fiberize wheat gluten into a crab meat analog. Briefly stated, the analog of finely fibered structure is produced by blending a reducing agent and a foaming agent with wheat gluten. Then, the blended material is heated to gelation.

The reducing agent may be any food-grade type such as sodium sulfite, potassium sulfite, sodium bisulphite, pottassium bisulphite etc. Not more than 0.3 percent of the agent (used alone or in combination with other reducing agents) by weight of the wheat gluten is necessary.

The foaming agent used should release gas at room temperature or during the heating operation after being blended with wheat gluten and mixed with water. Sodium bicarbonate, potassium bicarbonate, sodium carbonate and potassium carbonate are typical foaming agents that can be used. Usage levels can range from 0.1 to 3% by weight of the wheat gluten.

Seasoning of the analog meats can be done by adding an appropriate amount of spices and/or flavouring during the blending operation, or alternatively after the completion of the process. (Food Engineering. 3(4); 1978; 43)

113 New source of soluble protein

A soluble hydrolysed gelatine for protein enrichment of beverages, food products, pharmaceutical and cosmetic preparations has been developed.

Hydrolysed gelatine is a protein of high purity and is completely soluble in water at ambient temperatures. It is a protective colloid and dispersing agent acting as a stabiliser or emulsifier in food products, such as sauces, toppings, syrups, dressings, soups, milk powder dessert mixes, fruit squashes and concentrates, low calorie frozen and other desserts.

Hydrolysed gelatine is produced by enzymatic hydrolysis of a gelatine solution followed by spray drying. The product is a pale yellow powder with bland taste and giving solutions of high clarity.

Product specification is that no gelation occurs with a 50 percent w/v solution at 10°C. Visocosity is less than 5000 cP with a 50 percent w/v solution at 20°C, pH 4.5 - 5.0 and moisture content 5-7 percent.

The assessments which have been carriedout on flavoured spray dried hydrolysed gelatine, prepared as drink bases, show greately superior palatability compared with formulations based on liquid protein hydrolysates containing preservatives.

The fact that hydrolysed gelatine can be prepared and stored in the dry form without the need for preservatives provides an important advantage with regard to requirements of food standards. The need for specific approval for use of preservatives is avoided where products can be prepared in a dry powder form. Also the dry product avoids the co-addition of preservatives to foods where food standards may not permit the use of preservatives.

A further important feature in the preparation of a dry product is the degree of microbiological control which can be exercised. High microbiological quality is ensured through the quality of the gelatine starting material together with pasteurisation stages in the conversion to the spray dried hydrolysed product. (Indian Food Packer. 32(3); 1978; 94)

114 Lecithin free of crude soybean oil

Substantially free of crude soybean oil is a granular product from Alcolec PG, a purified lecithin product which is soybean lecithin obtained by extracting at a relatively low temperature, removing part of the oil resulting in a purified phosphatide containing about two-percent residual soybean oil. Applications of this lecithin product include cereals, fruits, juices or other foods and beverages. Alcolec PG is soluble in most common fat solvents except acetone and may be

dissolved in mineral oil.

The product is ideal for incorporation in flavoring oils, as Alcolec contains a low flavor level. (Processed Prepared Food. 147(9); 1978; 104)

115 Removing flatulence factors from soybean

Soyabean (Soy) products could become more important sources of protein for human consumption, if it were not for the discomfort of flatulence that is associated with ingesting soy products. Studies have led to the conclusion that two oligosaccharides in soyabeans - raffinose and stachyose are the flatulence inducing components.

Researchers at USDA's laboratories have isolated an enzyme-mix of alpha-galactose and invertase that appear useful as catalysts for hydrolysis of the above oligosaccharides to monosaccharides (fructose and galactose) so that the latter can be removed by dialysis from soy-milk or soy-whey. The enzyme galactosidase exhibits stable optimum activity at pH 5, the pH of soy-milk and is useable at temperatures upto 50°C. (Indian Chemical Journal 13(9); 1979; 36)

116 A Japanese method for fish meal production

The fish processing plant waste consists of 50 percent water, 30 percent protein, 15 percent oil and 5 percent ash. The material is heated to 80°C under low pressure and a recovery rate of about 50 per cent has been quoted. (Indian Sea Foods. 13(4) & 14(1); 1978; 32)

117 Removal of cellulose from rapeseed

Dehulling and sorting line enables 90 to 98% of cellulose contained in rapeseed to be removed in a continuous process operation. The percentage achieved depends on the rapeseed variety being processed.

The novel process utilized is claimed to give minimum rupture of the oil-containing cells, thus preventing oil losses and ensuring

exceptional yield. The resulting cake is an excellent source of assimilable protein.

In addition to rapeseed, the equipment can equally well be used for sunflower seed. Output of the first prototype is 3 to 5 t/h. (Food Engineering. 3(10); 1978; 37)

118 Caffeine from coffee

The average ~~coffee~~ Caffeine content of the coffee plant is 1.2%. Ever since coffee was first used there have been a great deal of criticism levelled at its physiological action in humans. It is known that caffeine in sufficient amounts affects the nervous, cordiac and kidney functions of human body. The decaffeinated coffee industry has expanded to provide coffee for those who are sensitive to caffeine. Its primary objective is the removal of 97% of the caffeine present in coffee without impairing the flavourand quality.

In solvent extraction process of caffeine from coffee beans, five main steps are as follows:

1. The moisture content of the green coffee is increased from the original 10% to above 20%.
2. The coffee is treated with an organic solvent, trichloroethylene for a period of time sufficient to extract 97% of the caffeine.
3. The coffee is steamed to remove the residual solvent.
4. Excess moisture is removed by drying.
5. The decaffeinated coffee is roasted and packed.

The first three operations are carried out in an enclosed rotating drum. The wet coffee is taken out of the drum and put into a separate dryer. The dried coffee is then roasted and packed in the usual manner.

The purpose of introducing moisture into the coffee beans is to

dissolve the coffee and make it possible for the organic solvent to extract it by ordinary diffusion mechanism. Previously it was found that at least 18% moisture is required but afterwards it was found that even more moisture is desirable if time of extraction is to be reduced to a minimum.

After the coffee beans have been properly wetted with water caffeine is extracted by circulating trichloroethylene at 70°C through the drums containing the coffee. In this step usually a battery of drums are used for counter-current operation. After the caffeine content of the beans has been reduced to about 0.03% the extraction is discontinued and the residual solvent is drained off the beans. At this time the trichloroethylene held by the beans is roughly equal to the weights of the dry beans and it is removed by steaming with live steam for several hours. The final coffee contains a considerable amount of water.

The beans are now dried in a tray dryer to about 10% moisture. Trichloroethylene is recovered from caffeinetrichloroethylene solution by distillation in a continuous natural circulation evaporator. The concentrated residue is a solution of 60% caffeine and 40% other materials; the latter largely composed of the wax that originally constituted the protective layer on the outside of the coffee beans. This wax has never been used for any commercial purpose. The solution is sent to the caffeine-refinning operation for the recovery of caffeine. (Cottage industries. 12(4); 1979; 14)

119 Tamarind seed starch

This starch, a substitute of Sago and Tapioca Starch is used for sizing and finishing purposes in jute and textile industries. It is prepared from tamarind seeds which are thoroughly washed with water to free them from any adhering pulp. The seeds floating on the water are discarded and submerged seeds are taken out and fumigated with sulphur dioxide gas or soaked in 25% brine solution. Then the seeds are dried and the starch is recovered from the dried seeds as per process given below:-

1. Cleaning of seeds to remove foreign material and the spoiled seeds.

2. Roasting of cleaned seed in mechanical roasters or manually in open pans with sand.

3. Cooling of seeds after roasting process for a period of 6-7 days. After cooling the kernel shrinks a bit and it enables easy removal of hull in the decorticators

4. Grading of seeds to prepare the seeds for pulverizing. Be sure that only graded and pure white kernels are required. These kernels as obtained from decorticator will be having about 3 to 5% of undecorticated seeds.

The kernels are now taken into pulverizer where they are powdered. The pulverized powder also commonly known as tamarind seeds starch is cooled for a period of 3-4 hrs. Now this powder is taken into sieving machine where starch is sieved through different mesh ranging from 60 to 100 mesh depending upon the consumers requirement.

Note:

1. During roasting, care must be taken that the kernel inside the seed is not damaged or over-roasted, because it destroys the quality of starch resulting in cream colour.

2. During roasting, the air and moisture contents of kernel is reduced.

3. Roasting and cooling of seeds imparts resistance against attack by insects to the seeds and well roasted seeds can be stored for a longer period of time without due spoilage.

4. The percentage of hull to the seed is 35 to 40%. As such for every 100 kgs of seeds fed, only 60 to 65% of kernels are obtained.

5. During pulverizing process 1% of wastage occurs, i.e., 99 kgs. of powder is obtained from 100 kgs. of kernel fed into the pulverizer.

(Cottage Industries. 12(4); 1979; 14)

BYPRODUCTS AND WASTE UTILIZATION

120 **High protein from wheat germ product**

A partially defatted wheat germ product that contains half of the natural polyunsaturated oil of the wheat kernel is toasted and stabilized for addition to a variety of prepared foods. The product called Embo contains approximately 34 percent protein, with an excellent amino acid balance. High in 9 vitamins, the toasted wheat germ is offered in varying sizes from nuggets to regular granules. Fiber content is 2.4 percent and fat is five percent of Embo. (Processed Prepared Food. 147(6); 1978; 50)

121 **Cooking fuel from farm wastes**

The Philippines National Meat Inspection Commission, Research and Technical Services Division, has found a way of preparing an inexpensive, odourless cooking fuel from six parts of carabao and cattle dung and one of rice hulls. The mixture is compacted with a manual press and dried in the sun for 10-15 days, reducing the moisture content to 10 per cent. The fuel takes about 15 minutes to ignite and can cook three chupas (1.125 liters, weighing about 450 g) of rice in 30 minutes. The only disadvantage is that constant attention must be given to the fire so that the ash does not build up and smoother the flame. A new stove design might be the solution. (UNIDO Newsletter. No.127; 1978; 4)

122 Incentive for bagasse use in paper making

Total excise exemption has been granted for writing and printing paper to be produced by new units using at least 75 percent of bagasse. Priority will be accorded to sugar mills who set up the paper units. Depending on their response, licences will also be issued to private entrepreneurs including large industrial houses. (Indian Sugar. 28(11); 1979; 733)

123 Waste compactor ensures hygienic trash disposal

Food factories, bakeries, canteens and hospitals will find this compactor an efficient and hygienic tool for waste disposal. Exerting a pressure of up to 1.5 tons, the equipment reduces volume of most waste materials to approximately one sixth. It can handle all types of normal refuse such as wet or dry garbage, food waste, tins, bottles, paper or plastic.

Designated Electropactor, the unit is housed in a totally enclosed cabinet to provide odor-free disposal. Materials are compacted directly into strong polyethylene bags which are then sealed. Operation is by push-buttons. (Food Engineering. 3(4); 1978; 90)

124 Heat recovery application

A company in the bakery equipment business has developed a method for recovering waste process heat to heat or chill factories. The ovens from which the waste heat is recovered and put to productive use are gas fired. There will be continuing saving of 40% on energy costs. (Food Manufacture. 53(7); 1978; 71)

PROCESSED PRODUCTS

125 Low-calorie dairy spread

A new low-calorie dairy spread developed in Sweden is a noteworthy

nutritional advance in modern nutrition to provide better nutrition against cholesterol and obesity. This new product combines the respective merits of butter and margarine - including the latter's excellent spreadability when taken direct from the refrigerator. The product has been introduced already in London and Tokyo markets. It accounts for 90% of light margarine sales in Sweden.

The new nutritional product is a blend of butter oil, butter milk and vegetable oil. High spreadability is ensured by means of a new process, which allows water to be mixed into the protein solids, instead of vice-versa. The fat content at 40% is only half that of butter and margarine. The product is lower in calories and higher in polysaturated fats and proteins as compared to butter and most margarines. It is cheaper than butter. Further, dairy ingredients account for 80% of its volume and impart a better taste. The dairy ingredients are emulsified with vegetable oils, chiefly soya oil. (Indian Chemical Journal; 13(9); 1979; 36)

126 Yogurt powder

A series of yogurt powders for applications ranging from baked goods and salads to confections and frozen desserts has been developed. It contains dehydrated yogurt (cultured milk and nonfat milk) with viable organisms L. bulgaricus and S. thermophilis. Butterfat level measures 18% minimum. Two other nonfat yogurt powders are one containing dehydrated nonfat yogurt similar to instant milk in instent powder form and another consisting of dehydrated nonfat yogurt to which sodium citrate is added. All these ingredients offer convenience of handling, storage, and mixing, and need no refrigeration. (Food Product Development. 12(10); 1978; 39)

127 Italy - Renowned for its cheese

Italy is world famous for its many tasty varieties of cheese. Who does not know about parmesan cheese, which was being made as early as 1000 A.D., or Gorgonzola cheese which originated in the 13th century?

Italy produces, in all 195 varieties of cheese, of which 120 are made from cow's milk, 30 from buffalo milk (e.g. the highly prised Mozzarella), 40 from sheep's milk, and only 5 from goat's milk. Moreover each region has its specialities: e.g., there are 13 special types in the Abbruzzi mountains, 26 in Campania, 16 in Emilia, 14 in Sardima, and 12 in Sicily. The major part (80%) of the production is "sweet" cheese, 10% being sharp cheese, and another 10% smoked cheese. 25 types of cheese like the Parmiggiano-Reggiano (Parmesan) are used both as grated cheese and as sliced cheese. (Lebensmittel-Industries. 25(4); 1978; 156)

128 Peanut flour has new application areas

Peanut flour exhibits compatibility with seafood flavors such as shrimp and salmon and actually enhances seafood taste. The addition of 10% peanut flour (basis wheat flour) thickens and improves the mouthfeel of tempura batter coatings. Peanut flour also binds and emulsifies comminuted fish foods. Salmon patties, loaves, and croquettes made with peanut flour exhibit excellent texture.

Peanut flour not only enhances vegetable flavor, but also brightens the color of some products such as carrots. In corn custard, for example, a toasted or roasted corn flavor is obtained.

In soups, peanut flour provides several benefits. Pea, tomato, and lentil soup flavors are enhanced by the ingredient. In the case of pea soup, peanut flour makes up for vegetable flavor lost during processing. Tomato soup attains a pleasant, unique flavor character. Furthermore, soups containing peanut flour exhibit thicker, smoother mouthfeel.

Meats: Peanut flour added to saucesglazes "finish" meat products. In meatloaf, the ingredient functions as a binder.

Cheeses: Thickening and emulsifying properties of the flour are advantageous in cheese spreads and dips. Ingredient flavor blends easily with these dairy products.

Currently, five types of peanut flour are available. Of them full fat flour contains 26.5% protein, 49% fat, 17.8% carbohydrate, 1.9% crude fiber, 2.3% ash, 2.3% moisture. Roasted flour contains 42% protein, 34.1% ash, fat, 1.2% moisture, 2.5% crude fiber and 20.2% carbohydrate. Also available are a peanut and soy flour blend, peanut flour mixed with whey, and peanut butter powder. Peanut flours generally are almost tasteless and odorless and may be used at levels offering significant savings. (Food Product Development. 12(10); 1978; 54)

129 Texturised soy protein

Soy protein with improved flavour, high protein content, high water absorption and improved textural integrity has been developped. It hydrates approximately 300 percent in cold water in 20 min. making it well-suited for use in meat plants where maintaining a cold environment is essential. (Processed Prepared Food. 147(6); 1978; 50)

130 Protein supplement for diet foods, beverages

Savortone 477 Calcium/Sodium/Caseinate, a dispersible milk protein source, is designed for protein supplements, diet foods and beverages, and pharmaceutical preparations. Ingredient offers a readily dispersible protein source (94% protein min.) with bland flavor, good mouthfeel and heat stability, and increased density. In addition, its protein is nutritionally complete containing all the essential amino acids and meeting government PER standards for high quality. (Food Product Development. 12(10); 1978; 46,50)

131 Freeze - dried expresso coffee

Freeze-dried expresso coffee will be introduced to the American market in November of this year. It will be available in two types of packages. Single-serving foil pouches are packed 10 each to a 0.4-ounce (12g) box. There will also be a 1.7-ounce glass jar, which will make about 30 cups. (Food Engineering. 3(10); 1978; 22)

EQUIPMENT AND MACHINERY

132 Conveyor system withstands low temperatures

Conveyor system speciafically designed for empty or lightly loaded boxes will operate in temperatures ranging from minus 200° to 250°F. The system uses a plastic chain and accommodates vertical and horizontal curves in a single conveyor. Other features include; chemical resistance, minimal required maintenance, no chain or roller tube, quiet operation and adjustable side guards for different container sizes. Conveyor modules are avialable with galvanized steel framework or with stainless steel as an option. (Processed Prepared Food. 147(6); 1978; 77)

133 Vertical conveyor

Spectoms offer a versatile vertical conveyor (Vertilift) for economical, efficient and dust-free handling of dusty, powdery and granular material. The machine avoids segregation of material and ensures dust-free conveying. There is no need to make holes in the floor or to dig pits for dump hoppers. The unit is offered in MS or SS construction. The conveyor is suitable for handling baking powder, flour, milkpowder, soap powders, starch, sugar and tea. (Industrial Products Finder. 7(3); 1978; 72)

134 Machine segregates materials by their conductivity

A separator, now available in laboratory and production models, utilizes high voltage electrostatic charges to remove contaminants from grains and processed foods. A mixture is fed on to a rotating drum, where it is exposed to a flow of electrons at potentials up to 50,000 volts. Conductive particles fall from the drum, while nonconductive particles are held against the drum by the electrostatic effect until rotation carries them out of the electrons flow and permits them to drop. (Food Product Development. 12(10); 1978; 78)

135 Vibratory sieving/grading machine

Vibratory sieving/grading machine is electrically operated and designed on the rotary vibration principle. The high-speed machine is suitable for wet and dry screening. A 3-phase TEFC motor imparts horizontal vibrations of high frequency to vibrating section, allowing even thick slurry to pass quickly through the screen. Easily replaceable screens of up to 400 BSS mesh size can be used. Mesh and aluminium alloy bowl can be easily cleaned. Working height is adjustable to enable graded material to be collected directly in storage bins. (Industrial Products Finder. 7(8); 1979; 49)

136 Sieving machine

The X-press sieve is a rotary sifting and straining machine for plastic 3? in powder form. Material fed into the hopper passes through a rotary screen directly attached to the motor shaft which rotates within an aluminium casing fitted with a discharge spout. Output depends on particle size, agglomerations, and perforation or mesh size of screen. Foreign matter or hard-to-dissolve agglomerates remain in the lower part of the rotary screen, from where the residue is removed periodically. The machine may be used as a control screen in the chemical, pharmaceutical, cosmetic and food industries. (Indistrial Products Finder. 7(7); 1979; 37.)

137 Horizontal multiple plate filter

The horizontal multiple plate filter is for batch/polish filtration. It consists of a number of horizontal plates, with filter media in between, housed in a vertical cylindrical pressure vessel. Filter media used include paper, pad and fabric. The vessel with cover in position provides a totally air-sealed system for the filter. The design permits last drop filtration to be carried out without the use of conventional scavanger plate. The filters are of sanitary construction and are available in steel and stainless steel. Diameter and number of plates can be varied depending upon the filtration

area required. The entire stack of plates can be removed as a unit and the filter can be provided with a jacket for cold or hot operation. (Industrial Products Finder. 7(7); 1979; 51)

138 Sifter for hard to sieve products

A high capacity power sifter is specially designed for difficult-to-sieve products. The unit is made to sieve highmoisture content flour, powders, juices, pulps, wet starches and mashes, sticky spices and granular or slurry liquids. Large model sieves sift upto 50 tons per hour. All that is necessary to change sieve frames, is the removal of of one end cover. Sieve frame is snapped open and frame slides out. The sieve can be changed in less than 60 seconds.

Frames can be fitted with any kind of sieve-nylon, polyester, stainless steel, brass or phosphor bronze. (Processed Prepared Food. 147(6); 1978; 76)

139 Open-type mini centrifuge

Open type mini centrifuge machine model IDC 1 has been designed for routine qualitative and quantitative semi-micro, micro and macro analysis of chemical, clinical, pathological, microbiological, food, drug and soil samples. It can also be used for laboratory separation or extraction. The centrifuge is provided with an angle head which can take 4 Small tubes each of 5 ml capacity or two large tubes each of 15 ml capacity. It revolves at a speed of 2,000 RPM. The shock-proof, acid-proof, durable body is made out of polypropylene. Rubber gasket at the base is leak-proof. Equipped with a brushless motor, the machine is noiseless in operation. A plug and a push button switch are provided close at hand for easy operation. (Protein Foods And Nutrition Development Association of India. 19; 1979; 1)

140 Band saw blades

Band saw blades have been designed with several important features. Twist spring back is suited for bone, soft tissue and frozen

sawing. High flexibility promotes smoother pulley tracking, less stress when cutting and longer blade life. Precisely tempered steel combines flexibility and toughness for maximum sawing effectiveness. In addition, narrow tooth set will assure precise cutting efficiency. (Processed Prepared Food. 147(6); 1978; 77)

141 Steam brushing system for peeling

The machine peels and cleans up to twenty tons of carrots, potatoes, turnips, beets, sweet potatoes and apples per hour. The machine features a belt of 12 synthetic fiber brushes situtated between the steam or lye peeler and the final washing unit.

Both the brush bearings and drive are protected against penetration of peelings, dirt and water. Material that comes into contact with the product is stainless steel. A built-in spray system simplifies cleaning of the system. (Processed Prepared Food. 147(10); 1978; 84)

142 Ham-boning line increases yield

High-efficiency ham boning line increases lean meat yield as well as overall yield from green hams, according to the manufacturer. The line is designed to meet industry needs for greater control over boning operations with a series of work stations established laterally along a slow-moving conveyor belt. Two hams are delivered in trays to each station where the worker proceeds to debone and disassemble the ham into lean meat, shank, fat and skin, bone and trimmings, when both hams are finished, the separated meat parts are placed in trays on a finished, the separated meat parts are placed in trays on a second conveyor for quality check by an inspector at the end of the line. (Processed Prepared Food. 147(6); 1978; 79)

143 Grinder for the kitchen

The grindmaster is an all purpose commercial grinding machine for use in the kitchen. It can be used for both dry and wet grinding. The maximum capacity is 4.5 kg. Hygienic and fast, the machine grinds food

grain, dry masala mixtures, coconuts, and wet mixtures preparations for idli, dosa, wada, chutney, curry, pickles and sauces to the required fineness. It can be adjusted to grind wheat, rice and other cereals into flour or rava. The machine churns butter and makes mixes for cakes. It is reported that almost any ingredient can be reduced to pulp or powder within 5 to 15 minutes, fully retaining its taste, flavour and vitamins. (Industrial Products Finder. 7(4); 1979; 3)

144 Micro pulveriser unit

The micro pulverisers provide maximum output with minimum power consumption and vibrations. With extraordinary power for particle size reduction, it pulverises, grinds and collects the output in one single operation. The machine works on pneumatic principles and therefore grinding is cool and frictionless, spare parts requirement is minimised because of special hammers which are carbide treated. Standard models are: 5 HP Jupital Cub, 10 HP Jupitor Junior and 20 HP Jupitor Senior. Applications are in chemical, pharmaceutical and food industries. (Industrial Products Finder. 7(7); 1979; 12)

145 Micronizer

The NDM micronizer, a special machine suitable for particle size reduction in one operation to 300-450 mesh of soft, medium and hard materials. There are no screens and adjustment of size is by Whizzer system. Operations involved are regulated feeding, grinding in a chamber lined with stainless steel chippers, classification by Whizzers, and finally a cyclone dust collector that allows particles less than 5 microns to escape. The machine finds wide application in the chemical, pharmaceutical and food processing industries. (Industrial Products Finder. 7(6); 1979; 50)

146 Homogenizer has non-contact sealing

The homogenizer is based on a high-pressure plunger pump with a non-contact sealing system that replaces the conventional packing. This

design eliminates friction normally occurring between collar and piston as well as the resulting losses due to friction and wear, thus ensuring high mechanical efficiency.

Suitable for all dairy products, baby foods, flavours, fruit pulps and similar products, the homogenizer is designed for three-shift operation. Several models can be supplied for flow rates from 720 to 120,000 I/h. Continuous operating pressures range from 50 to 1000-bar, and power rating from 0.73 to 730 KW are available. (Food Engineering; 3(4); 1978; 94)

147 New hullers for handling nuts

The California nut processing industry has been testing two new pieces of equipment. Both machines are now available to commercial food processors. One of them, the Model F Magnuhuller unit, is being used throughout the state for hulling filberts and hazelnuts. With certain roll modifications, the machine has the capability for hulling almonds, walnuts, and other nut foods. In the pistachio application, the Magnuhuller F is usually followed by a model H stemout machine for final removal of loosened hulls. The Magnuhuller has a capacity of 6,000 to 8,000 lb/hr on pistachios. (Food Engineering. 3(4); 1978; 90)

148 Drum mixer

A drum mixer which is of particular value where there is a frequent change of the product to be mixed or homogenised has been developed. Four types are available to suit drums from two gal to 75 gal. The drums have been designed to be simply exchanged so that they can be used for transferring the product. The hoop is designed for the dual purpose of mixing and conveying the drum. (Food Processing Industry. 47(562); 1978; 68)

149 Small dryers permit realistic studies

Dryers which are smaller and less expensive than typical pilot plant equipment, yet able to vary several important processing factors over wide ranges are available. The stainless steel equipment makes it

possible to obtain scale-up and product quality data without large scale experimentation.

The rotating tube dryer can be used for current or countercurrent drying. The feed rate can be varied up to 5 lb/hr, air temperature up to 500°F, and air velocity from 75 to 350 ft/min. Also variable are drum speed, angle, and flight configuration. A completely integrated unit requiring only connection to electric power, the dryer has outer dimensions of 4 x 2 x 3 ft.

A vertical pneumatic dryer, permits bench or pilot scale flash drying. It is available with optional recycling system for extending residence time, and it may be used as the primary or finish dryer in combination with rotary dryer. This vertical dryer processes a maximum of 5 to 20 lb/hr at air velocities up to 6,000 ft/min and air temperatures up to 1,300°F. It stands 5 ft long x 2 ft wide x 10 ft high. (Food Product development. 12(10); 1978; 78)

150 Speeds up freeze drying

A new heat control device greatly improves the reliability and speed with which substances can be freeze dried. The instrument called Edwards Resistivity Controller cuts drying time for some common products by more than half and renders obsolete the traditional methods of determining safe drying temperatures for complex substances and determines the lowest eutectic point of a substance (the temperature at which it completely solidifies) by monitoring its resistance, which varies with its physical state. (Food Manufacture. 53(7); 1978; 79)

151 Freezes pre-cooked food

Capable of efficiently freezing 45 kg of pre-cooked food from + 70 to -20°C in 90 min, this 10-tray freezer unit is designed to take either six 140 x 140 x 40-mm bulk foil packs or five half-gastronorm size containers.

Of timber-free construction with 105-mm foamed polyurethane insulation, the unit has loading and unloading doors at each end to provide pass-through facilities for a batch flow production catering system.

A 7.3 Kw air-cooled condensing unit maintains the high velocity air at a temperature of -32°C to give the essential rapid reduction of temperature necessary to maintain flavour, texture, appearance and nutritional value of the food. Automatic defrosting and dual temperature facilities are provided for overnight freezing. (Food Engineering. 3(4); 1978; 84)

152 Continuous fryers

The new PHL/Titan range of continuous fryers, has effective belt widths of the fryers, designed on a modular basis from standardised components, are 400, 630 and 1,000 mm and combiner with tank lengths between 1.6 and 3.2 m give a range of frying services from 0.6 to 3.2 m^2.

Frying oil is continuouslycirculated through an easily cleaned filter element and heating may be electrical elements immersed in the oil bath or indirectly by means of a thermal oil in conjunction with a gas or oil fuelled heat exchange unit. For light products, which tend to float, the conveyor is fitted with paddles to control the flow through the oil; for very light products which need to be totally immersed a top belt is available. (Food Processing Industry. 47(558); 1978; 71)

153 Heat exchangers have new design

Scraped surface heat exchangers are designed for heating, cooling or crystalizing products from cooking and cooling apple sauce to slush freezing citrus concentrates. The units feature a mutator shaft within a four-inch diameter by 120-inch stainless steel heat transfer tube with removable stainless steel (steam or liquid) jacket. The liquid jacket can be sanitarily designed to allow heat interchange between two products. A carbon steel jacket for direct expansion refrigerant is also available. (Processed Prepared Food. 147(6); 1978;79)

154 Juicer with a suction base

The juicer has a suction base that grips any smooth laminate surface on the table top. Its lightweight alloy base has been designed to be practical. A finger-tip screw control is included to detach the cup from the base for easy cleaning and washing. A stainless steel filter strainer is included. A handy flip-over lever activates the rubber suction cup. Uses are in industrial canteens, restaurants and kitchens. (Industrial Products Finder. 7(5); 1979; 73)

155 A rotary dewatering press

A rotary dewatering press capable of converting a fiber-containing slurry whose-solids content is as low as 4% into a cake having 40% solids has been introduced. The application is in the pressing of sugar cane, sugar beets, and fruit juices.

The slurry is fed between a corrugated master roll and four spring-loaded press rolls whose distance from the master roll decreases progressively from 1 inch to $\frac{1}{4}$ inch. Doctor blades transfer the solids from press roll to press roll and then to a conveyor belt, while the expressed liquid drains into the space below the press.

The rolls are 28 inches long. The master roll is four feet in diameter, and each press roll is two feet in diameter, they are all supported by sealed roller bearings, and require only periodic lubrication. Driven by a 50 horsepower motor, the speed of the master roll is variable from 0 to 5 rpm. Maximum throughput in 24 hours varies from 45 to 100 tons, depending on the material being processed and the degree of dryness required in the cake. (Food Engineering. 3(10); 1978; 113)

156 Improved Distillation Still

The conventional distillation stills used for the extraction of oil from essential oil bearing plants are not highly efficient. In these stills distillation has to be carried out for longer periods costing more energy and the recovery of oil is only 60-70% of the total oil content.

In order to overt these draw-backs, the laboratory developed a new type of distillation still. The still has been designed keeping in view the dimensional proportionality. A new type of steam injector is incorporated in this steam jacketed still to effect better distribution of steam through the plant materials. A condenser on the lid is also fitted to ease the operation. The improved still yields about 90% of the totaloil and cuts down the distillation time by 30%. (Regional Research Laboratory (Jorhat) News. 2(11); 1978; 3)

157 Weighing & Filling Machine

The weigher-filler is a precision semi-self indicating weighing machine. Compensating mechanism for material-in-flight ensures precession filling with high accuracy. The solid-state electronic control system is accommodated in a compact panel. All functions are neatly and separately arranged on individual boards (modular design) to guarantee easy service. The weigher-filler can be used in chemical, cosmetic and food industries. Capacity ranges from 1 to 300 kg. The machine features dual speed and slow filling for accuracy. (Industrial Products Finder. 7(6); 1979; 31)

158 Fume and gas detector alarm

Fume and gas detector alarm is capable of detecting various explosive and toxic gases of the hydrocarbon group and their derivatives, alcohols, inorganic gases, esters, ethers, halogenize hydrocarbons and cooking gas. Choose LEL or TLV levels for a particular gas to be detected and the instrument gives an alarm, visual and audio, for early warning. (Industrial Product Finder. 17(1); 1978; 239)

PACKAGING

159 Fibre drums replace steel drums

Warden's fibre drums are made from a combination of several plies of concentrically wound paper or board. The low-cost Warden drums replace steel drums and reduce freight charges. The bottom consists of a plywood disc fastened into position by a metal ring. A similar detachable disc at the top provides the covering. The lid is held down by a metal clamp, or locking ring, which is provided with a clasp for sealing. The drums can be waxed or varnished or both waxed and varnished to make them water-proof. Painting and printing can be done to enhance visual appeal. The drums are recommended for packing granules, flakes or powder. Pastes and liquids can also be packed when used with flexible or rigid polythene liners. Sizes range from 30.5 cm to 45.7 cm diameter. The height goes up to 106.68 cm. (Industrial Product Finder. 17(1); 1978; 239)

160 Insulated fish boxes

The marine products export development authority is proposing to popularise small insulated fish boxes of the capacity of 56 kg. These are suitable for storage and transport of fish and shrimp in ice. The particular design now offered for insulated boxes has been evolved after a series of field trials of different models. It has been decided to supply these boxes at half the cost. The authority is implementing the scheme in a bid to improve the quality of raw material received in processing plants.

One of the easiest and most widely used methods for keeping fish and prawns in a fresh condition is keeping them in ice. It is known that the rates of spoilage of fish at 5.5°C is twice as fast as at 0°C and at 12°C is four times as fast as at 0°C. (Indian Seafoods. 13(4) & 14(1); 1978; 31)

161 Semi-automatic capping machine

The new dual head filamatic model AUA-120-2 table model, semi-automatic capping machine is designed for tightening plastic or metal screw caps two at a time. Caps of up to 120 mm size can be tightened to a predetermined torque by merely placing two containers with the caps loosely installed in position on an adjustable nesting type holder. A footswitch triggers the operating machanism. The two capping chucks descend, tighten the cap, then return to starting position, ready to repeat the cycle. The capper operates only when two containers are correctly positioned under the chucks. The cycle will not repeat itself until the capped containers are removed and replaced by two more containers. (Industrial Product Finder. 7(3); 1978; 17)
Finder. 7(3); 1978; 17)

162 Peel-off lid for food cans

A new "peel-off" lid for food cans has just been developed by Alusingen, the German subsidiary of Alusuisse. The lid is reportedly a new solution to the problem of easy opening of cans. The overall membrane lid consists of an upper surface of lacquer, a central layer of aluminum foil, a proprietary middle layer and a final thermoplastic layer. This is a polyamide, where the package must be sterilized or "Surlyn" ionomer resin where there is no sterilization. The stock is also embossed for added strength. (Food Packaging And Labeling. 2(9); 1978; 1)

163 Vacuum gassing turret designed for canning milk powder

A vacuum gassing turret (Model VBK 556/73) is especially constructed for canning milk powder. Developed for a Dutch producer of milk powder, the machine is designed to give higher output with few operators.

The Model is a complete plant comprising essentially a clinching machine, one or more vacuum gassing turrets (according to desired output), final seamer and additional units such as collection

tables and conveyors. The turret can handle all can sizes standard to the work milk powder industry and features a patented guidance system that permits careful handling of containers. That avoids dents, scratches and marring of the filled cans.

The special feature of this milk powder canning unit is its flexibility. Several turrets can be combined into a complete canning line to increase production. And, since pre-evacuation in large containers is no longer necessary, fresh milk powder can be handled without preliminary treatment. (Food Engineering. 3(4); 1978; 75)

164 Plant makes blown film for milk pouches

Brimco have developed two types of plants for producing blown film used for manufacturing milk pouches. The plants of types BRMP and BRCE, produce polyethylene sheets. They are complete with aluminium rotating air cooling rings, included to reduce thickness variation in the blown film. To further stabilize the thickness of the film, rotating die and related equipment can be used which are offered as optional extras. This eliminates bulging when the film is wound in the winder. Models BRCE-50/2 and BRCE-65/2 co-extruded blown film plants can be mounted on revolving platforms, so that during operation they become revolving extruders. They are used to produce two different layers of film, one from each extruder, which can be in two different colours and which are moulded into one blown film before it goes to the winder. Besides LDPE-HDPE, nylon and polypropylene can be extruded. (Industrial Product Finder. 7(7); 1979; 65)

165 First high-speed tetrahedral pack system for soft drinks

A new HT-150 high speed TETRA PACK Cartoning machine for their range of Calypso soft drinks Has been designed.

Four separate units have been installed, each with a capacity of 7,200 cartons/hr. Tetrahedral packages are produced from pre-printed paper/plastic laminate reels, each containing approx 7,500 cartons. Sealing is below the liquid level and this produces an air free package

which helps to keep the quality of the product. The packaging unit applies a strawhole to each carton with an easy open pull-tab.

This new packaging installation has removed the need for manual packang and has increased the output to around 20 boxes/min. The finished cartons have a capacity of 150 ml and the opportunity has been taken to introduce a new surface design. (Food Processing Industry. 47(562); 1978; 73)

166 Confectionery twist wrapper

A new double twist wrapper for confectionary with a double disc feed system is claimed to have increased output by 10 percent over its forerunner and permits radial alignment of the feed pockets with an increased number available for feeding, making it simpler and highly accurate.

A new wrapping material feed and knife system widens the choice of materials which can be used, and these now include polypropylene, cellulose films and waxed papers. Machine speed is variable from 300 to 500 cycles per minute. (Food Processing Industry. 47(562); 1978; 68)

167 Prepac sachet filling machine

The first prepac sachet filling machine manufactured in India is undergoing prescribed tests and inspection. This machine incorporates all the recent developments and would be a boon to the liquid milk dairies in India. The first machine, will be installed in Dudh Sagar Dairy, Mehsana, Gujarat. (Indian Dairyman. 31(1); 1979; 67)

ANALYSIS

168 System speeds assay of ingredient protein

Equipment utilizing the Udy Dye Method gives protein value with a standard deviation from the Kjeldahl value of 0.2% or less. The dye binding method, approved by AOAC and AACC, provides economical estimation

of protein applicable to unaltered, sound commodities. The Udy Protein Analyzer with direct, digital readout of percentage protein avoids the necessity of using hazardous chemicals. (Food Product Development. 12(8); 1978; 96)

169 Instrument runs 20 specific sugar assays per hour

A new instrument utilizes a proven clinical laboratory method to measure sugars important in food industry applications. Quicker and easier than gas or liquid chromatography, the method is more specific than conventional tests based on optical properties, solution density, or chemical reducing power. The simple, 3-step operation requires minimal sample preparation to quantify sugar level in practical units 60 seconds after the sample is injected. (Food Product Development. 12(7); 1978; 78)

170 Oil and fat analysis in solid products

The Foss-Let oil and fat analyzer performs rapid oil or fat determination in solids. A sample is placed in a reaction chamber and perchlorethylene is added as an extraction carrier. The chamber is inserted into the vibrating reactor for a period of one and one-half-to-two minutes, during which time the sample is subjected to a powerful grinding action. After this is completed, the liquid is filtered into a measuring unit where the specific gravity of the oil/perchlorethylene mixture is measured. This measurement is converted directly into oil or fat percentage using a conversion chart. (Processed Prepared Food. 147(8); 1978; 116)

171 Fast test for unsaponifiables

A new method for unsaponifiable matter (USM) in fats and oils can give results in one hour rather than the six to eight hours required for current official methods. The simplified method, named "dry saponification technique", has advantages of being quantitative and reproducible and uses no flammable solvents. It can be followed by a technician with little or no scientific background.

Eastern Regional Research Center developed the technique and applied it successfully to many fats, including coconut, corn, cottonseed, peanut, olive, safflower, soy, cocoa, butter, lard, herring, and whale. (Food Product Development. 12(8); 1978; 96)

172 Fast test quantifies solid and liquid fat, free and bound water

Two compact, economical instruments from the Praxis Corporation employ pulsed nuclear magnetic resonance (PNMR), a nondestructive method able to determine both quantity and physical state of water or fats. They have application in quality control for grain-based, dairy, and meat foods.

The analyzer can determine moisture level and distinguish between free and bound water in ½ to 2 minutes. The unit helps predict emulsion stability since emulsion destabilization causes changes in the PR-103 reading long before visible phase separation occurs.

When running numerous soild fat content (SFC) determinations for specification, acceptance testing, process control, or troubleshooting with fats and oils, the SFC-900 analyzer can cut analytical time by one-third. A technician could determine SFC for up to 60 samples per day as against 20 samples per day with the conventional dilatometry.

Operation of the Praxis instruments is simple and fast because there is no need to weigh and usually no need to prepare the sample before it goes into the tube for measurement. PNMR measurements can be made with equal ease on solids and liquids, and samples can be stored for retesting later, since the analysis does not degrade them in any way. (Food Product Development. 12(8); 1978; 88)

173 Quick moisture tester

This low-cost unit measures moisture in ground samples by means of evaporation, using infra-red light rays. It is said to perform a moisture test in 3 to 10 minutes, depending on the test material. Accuracy is reported to be ± 2% over the full range of 0-100% total solids. (Food Engineering. 3(10); 1978; 110)

174 Meter for measuring moisture

Key feature of this instrument is a builtin microprocessor which enables direct readings of relative humidity and dewpoint without the use of psychrometric charts or complex calculations, over a temperature range from -30 to +100°C.

Measure values are indicated on a digital readout with an accuracy of 0.1 K $\pm$ 1 digit. Calculation accuracy for both relative humidity and dewpoint is better than 0.01%.

Suitable for use throughout industry, the portable, battery-operated instrument comes complete with psychrometric meter including linearizing circuit and fan to ensure adequate air velocity. It is particularly useful in environmental chamber applications and whereever rapid and highly accurate moisture and dewpoint measurements are imperative.

Dimensions of the instrument are 125 x 170 x 55 mm and its weight is 1.2 kg. The 12-V NiCd-battery allows approximately 200 measurements to be made before recharging. (Food Engineering. 3(4); 1978; 78)

175 Senses humidity at high temperature

Model 1220 Thermally Controlled Dew Point Sensor Unit mounted in a cabinet is capable of controlling temperature between 80 and 200°F. The NBS traceable sensor operates over a dew point range -60 to + 200°F with $\pm$ 0.4°F accuracy. The sensor can be employed with any General Eastern Series 1200 Dew Point Hygrometer. (Food Product development. 12(10); 1978; 85)

176 Automatic colony counting

The Biotran II provides almost instantaneous enumeration of a wide variety of colonies on many different kinds of agar plate. Equipped for reflected, transmitted, and dark field illumination, the instrument can count colonies or particles even on such media as opaque agar or a

filter. It detects objects as small as 0.2 mm and with visual contrast as low as 20 percent. Subsurface and slightly irregular colonies typically are included in the count. Accessories permit microscopic counting and counting in specialized containers. Mechnical and electronic masking, directly calibrated in mm offers the option of scanning only part of a plate. Particle size discrimination eliminates from the count all objects with an apparent image smaller than the minimum size, selectable over the range of 0.1 to 1 mm. (Food Product Development. 12(10); 1978; 85)

177 Sedimentation test mixer

This test mixer determines the sedimentation value for wheat flour in accordance with IS: 4782-1968. It is used by bread and biscuit manufacturers as well as flour mills. The device reportedly gives a simple and quick indication of the strength of wheat flour and predicts its stability for baking. Amongst other tests available for wheat flour the highest correlation coefficients have been established by USDA for the sedimentation test. This test will help in selecting suitable varieties of wheat for making good bakery products and also for segregation of wheat flour. As laid down in the standards, the test mixer has a rack to accommodate eight measuring cylinders of 100 ml size and the rack can be put in motion at 40 strokes per minute, 30° each side of the horizontal. A process timer is fitted with the mixer to stop the motion automatically at the end of a cycle. To add further chemicals while test is carried out, it is not necessary to take out measuring cylinders, as means are provided to bring cylinder in vertical position to accept the chemicals. (Industrial Products Finder. 7(8); 1979; 25)

178 Meter checks freshness of fish

The GR Torrymeter (developed in the UK) is a compact, robust, all electronic, reliable and portable instrument designed to assess the quality as related to freshness of the fish. The dielectric properties of fish tissue change progressively during the post rigor period of storage. The Torrymeter responds to the dielectric loss angle, thus

providing an accurate measurement of the freshness of fish. The instrument is held in hand and brought in contact with the fish's surface. The digital display gives an indication of tissue deterioration. It is capable of both single shot operation and batch assessment. The unit is housed in a sealed case moulding and can be wiped clean or even rinsed in water. It is battery operated and equipped with long life rechargeable cells. (Protein Foods and Nutrition Development Association of India. 23; 1979; 1)

179 Head Space Sampler

The HS-6 Space Sampler for gas chromatography recently announced by Per-Kin-Elmer has been designed for use with the company's Sigma series instruments and enables them to perform semi-automatically head space analyses. It is available as a factory installed option or can be retrofitted to existing instruments.

The system has a capacity of six samples providing adequate time for temperature equilibrium to be reached. Samples can be either solid or viscous liquids. Five second injection time is controlled automatically and the HS-6 sample is thermostatically controlled to better than 0.1°C over a temperature range of +40°C to +190°C. (Food Manufacture. 53(11); 1978; 37)

180 Automatic Karl Fischer titrator

The automatic titration apparatus is for rapid, accurate and easy determination of moisture (water) in samples by the Karl Fischer method. It finds applications in petrochemical, pharmaceutical, food processing and chemical industries. The device is suitable for carrying out increased number of titrations per hour, thus reducing operator's time. Special features include automatic filling and zero adjustment of burettes, sealed beaker, solenoid operated burettes, facility for back titration, and visible as well as audible end-point indication. (Industrial Products Finder. 7(5); 1979; 37)

181 Chemically inert filter fabric

Proplon is a chemically inert textile fibre which is resistant to alkalis, acids and organic solvents. It is reported to have no solvent at room temperature. Applications are in the manufacture of chemicals pharmaceuticals, dyes and pigments, and food products. (Industrial Products Finder. 7(5); 1979; 23)

ECONOMICS & COMMERCIAL STATISTICS

182 Per hectare yield of oil seeds in major producing countries.

(Yield in Kilogram)

Year 1976	Ground-nuts	Rape-Seed	Linseed	Sesamum	Castor-seed
Country:					
India	814	577	290	183	394
China	1271	488	442	426	340
America	2763	1133	484	706	265
Canada	-	1158	839	-	-
Sudan	1248	-	-	332	913
Senegal	895	-	-	-	-
Poland	-	2743	461	-	-
Argentina	1094	583	899	-	1082
World	957	836	422	308	506

(Oils and Oil Seeds Journal. 31(2); 1978; 33)

183 All India Final Estimate of Niger Seed 1978-79

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	15.1	14.6
Bihar	52.6	20.7
Karnataka	59.0	10.3
Madhya Pradesh	262.7	38.3
Maharashtra	102.4	18.0
Orissa	127.9	48.4
Dadar & Nagar Haveli	0.7	0.3
All India	620.4	150.6

Notes:- 1. Nigerseed crop is not grown to any appreciable extent in other States and Union Territories not mentioned above.

2. No information regarding crop estimates is yet available from the Govt. of Sikkim.

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Dept. of Agriculture, Government of India, New Delhi.

184 Estimated Production of Copra and Coconut Oil in India

Year	Copra (Tonnes)	Coconut oil (Tonnes)
1975-76	381,497	202,670
1976-77	388,958	220,975

Of the copra produced in India, 10-15% are used for edible purpose and the balance for oil extraction. (Oils and Oilseeds Journal. 31(2); 1979; 34)

Production of Tree borne oilseeds in India (Quantity in Tonnes)

State	Shorea robusta (Sal)	Bassica latifolia (Mohwa)	Azadirachta indica (Neem)	Pongamia glabra (Karanja)	Hevea brasiliansis (Rubber)	Salvodora olcoides (Khakan)	Schleicherra trijuga (Kusum)	Vateria Indica (Dhupa)	Mesua ferrea (Nahor)	Calophyllum Inopyllum (Undi)	Garcinia indica (Kokum)	Other seeds
Andhra Pradesh	-	- 6400	11500	40000	-	-	500	-	-	-	-	R
Assam	172478	-	-	-	-	-	403	-	5650	-	-	K
Bihar	3855022	147353	14130	46227	-	-	42000	-	-	-	-	M,Pa
Goa	*	-	*	-	-	-	-	-	-	*	*	
Gujarat	-	15162	19697	3121	-	31488	-	-	-	-	-	
Haryana	-	-	11287	-	-	-	-	-	-	-	-	
Karnataka	-	1896	18804	598	-	-	197	10000	-	542	650	M.KR.Pa
Kerala	-	300	-	*	45000	-	-	*	2150	2333	*	M.Pl
Madhya Pradesh	42500	41260	2075	379	-	-	300	-	-	-	-	R,Pa
Maharashtra	-	5046	26397	4211	-	-	-	*	-	*	1350	M.R.P.Pa
Orissa	1400000	10000	1000	3000	-	-	190	*	-	*	*	
Punjab	-	-	-	-	-	-	-	-	-	-	-	
Rajasthan	-	3500	32000	350	-	12182	-	-	-	-	-	R.K.
Tamilnadu	-	5000	37000	1920	5000	-	-	-	-	725	-	M
Uttara Pradesh	-	247578	210110	*	-	*	-	-	-	-	-	Ch.K
West Bengal	40000	6500	230000	6000	-	-	-	-	-	200	-	K.
Total	5504000	490000	418000	11000	50000	43670	43000	10000	7800	3800	2000	

Index: *Available in small quantities

Total: 67,30,800 tonnes

K:Kamala R: Ratanjyoti Ch: Chura M: Maroti Pa: Palashpi Pi: Pisa

(Oils and Oil seeds Journal. 31(2); 1978; 31)

Name of the Seed	Potential States	Season of Collection	Seed in tons		Oil in tons		Cake in tons	
			Potential	Utilisation	Potential	Utilisation	Potential	Utilisation
Kokum (Garcinia indica)	Karnataka, Goa, Maharashtra, Kerala	May-June	2,000	500	800	200	1,000	300
Nahor (Mesua ferrea)	Assam, Bengal Kerala, West Bengal	June-July	5,700	110	2,300	60	4,000	50
Dhupa (Vateria indica)	Karnataka, Kerala Maharashtra	May to August	10,000	4,000	1,000	400	7,000	3,500
Undi (Calophyllum inophyllum)	Kerala, Goa, Orissa, Bengal.	July-August	3,800	600	2,300	300	2,000	300
Rubber (Hevea brasiliansia)	Kerala, Tamilnadu, Karnataka, Tripura, Assam, Andaman.	August to November	50,000	23,000	12,000	580	40,000	1,700
		TOTAL:	67,30,800	292,943	10,36,400	66,330	49,54,000	222,000

(Oils and Oilseeds Journal 31(2); 1978; 31)

187 Production of cotton seed oil and meal

(thousand tonnes)

Year	Oil		Meal	
	India	World	India	World
Sept. - Oct.				
1976 - 77	202	2745	930	9102
1977 - 78	225	3010	1035	9914
1978 - 79	-	2900	-	-

(Oil and Oil Seeds Journal. 31(2); 1978; 33)

188 Production of raw cashewnuts - statewise

States	Area (000 hectares)	Production (000 tonnes)
Kerala	103	116
Karnataka	96	36
Tamilnadu	93	13
Other States (Andhra, Orissa, Goa & Maharashtra)	128	28
Total	420	193

Source: The Kerala State Cashew Development Corporation Ltd.,
(Industrial Development News 13(12); 1979; 175)

189 Cashew

A project for the development of cashew plantations in Karnataka is proposed to be implemented by the Karnataka Cashew Development Corporation and the Department of Horticulture with World Bank assistance. The project envisages an outlay of Rs.17.26 crores.

The project contemplates raising 10,000 hectares of new cashew

plantation and improving the existing 12,000 hectares of departmental plantation through the Cashew Development Corporation. The area of operation of this project would be districts of Dakshina Kannada,Uttar Kannada, Shimoga and Coorg.

Under the Project, 4,000 hectares each would be taken up under new plantation in Dakshina Kannada and Uttar Kannada districts. One thousand five hundred and 500 hectares would be developed in Shimoga and Coorg districts respectively. (Industrial Development News. 13(10); 1978; 125,126).

190 All India final estimate of Cardamom, 1978-79

State	Production in terms of Dried, Cured Cardamom (Thousand Tonnes)
Karnataka	2.6
Kerala	1.5
Tamil Nadu	0.5
All India	4.6

Notes:- 1. Cardamom is not grown to any appreciable extent in other states and Union Territories.

2. No information regarding crop estimates is yet available from the Government of Sikkim.

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Dept. of Agriculture, Govt. of India, New Delhi.

191 Availability of pulses in India

A survey conducted by Economic Times Research Bureau indicated that on the basis of a daily requirement of 2,350 calories and a daily protein requirement of 44.3 grams, the recommended daily cereal intake is 370 grams and the requirement of pulses and nuts is placed at 65 to 80 grams, provided vegetarians supplement their diet with 241 grams of

milk and milk products and non-vegetarians with 154 grams.

The average (vegetarian and non-vegetarian) daily intake is 70 grams of pulses.

Daily per capita Net Availability of Foodgrains (in grams)

Year	Cereals	Pulses	Total
1976	406.6	51.2	457.8
1977	395.4	43.3	438.7

(The Economic Times. May 16, 1979)

192 Consumption of oils and fats in the manufacture of Soaps Produced by Organised Sector during 1976.

Item	Quantity (in Tonnes)
Coconut oil	6047
Hard oils	-
Palm oil	3176
Tallow	5896
Mohua oil	16053
Sal oil	1696
Neem oil	5004
Kusum oil	-
Hydrogenated vegetable oil	-
S.E. Groundnut gr.II	21169
Castor oil	11440
Linseed oil	11508
Karanja seed oil	3[illegible]
Tobacco seed oil	-
Watermelon seed oil	-

(Contd...

Other oils	-
Rice bran oil	37996
Fatty acids	1285
Kusum oil	2366
Soft oils	-
Rice bran oil	11264
Groundnut (raw grade. II inedible)	5187
Rice bran oil fatty acids	-
Acid oil	4655
Soap stock	5585
Other oils & fatty matter	-
Raw linseed oil	609
Cottonseed oil	-
Castor oil	456
Other oils	722
Rosin	5684

(Oils and Oil Seeds Journal 31(2); 1978; 34)

193 Trade estimate of marketable surplus of new crop Groundnut Kernels During 1978-79 Crop year (Nov./Oct.)

State	Total Marketable Surplus in Groundnut Kernels (In Lakh Tonnes)
Gujarat	11.00
Andhra Pradesh	5.50
Tamil Nadu	4.00
Maharashtra	3.75
Karnataka	3.25
Uttar Pradesh	1.50
Madhya Pradesh	1.50
Rajasthan	1.00
Punjab-Haryana	1.00
Others	1.00
Total	33.50

(The Oils and Oil seeds Journal. 31(2); 1978; 23)

194 Use of vegetable oils in the manufacture of Paints and Varnishes during 1976-77.

Name of the Oil	Quantity	
Linseed oil	3610	Tonnes
Castor oil	814	"
Pine oil	127	"
C.N.S.L.	190	"
Bhiiawan	150	"
Kardi oil	220	"
Tung oil	106	"
Misc. (Tobacco, etc.)	1050	"
Coconut oil	306	"
Total	6573	"

(Oils and Oilseeds Journal. 31(2); 1978; 34)

195 State-wise distribution of oil mills in India

State	1975
Andhra Pradesh	527
Assam	N.A.
Bihar	1,456
Gujarat	1,208
Kerala	N.A.
Madhya Pradesh	2,963
Tamil Nadu	1,386
Maharashtra	1,689
Mysore	62
Orissa	N.A.
Punjab	N.A.

(Contd...

Rajasthan	2,000
Uttar Pradesh	4,293
West Bengal	623
Total	15,339

(Oils and Oilseeds Journal. 31(2); 1978; 34)

196

Oil Refining Industry in India

Refining Units	62
Installed Capacity	2000 tonnes per day
Investment	Rs.2000 Crores
Skilled Workers	3,000 to 4000
Unskilled Workers	25,000 to 30,000

(Oils and Oilseeds Journal. 31(2); 1978; 34)

197

Percentage of oil left in cakes on a 5% M.C. Basis

Expeller groundnut cakes	5%	11.6%
Ghani groundnut cakes	8.4%	11.6%
Sesamum ghani cakes	10%	18.4%
Sesamum rotary cakes	10.7%	12.4%
Castor expeller cakes	6.7%	7.9%
Castor ghani cakes	7.1%	9.7%

(Oil and Oilseeds J 31(2); 1979; 33)

198 Molasses and Ethyl Alcohol Exports Decanalised

The exports of molasses and ethyl alcohol has been decanalised.

The Commerce Ministry today put the exports of molasses, ethyl alcohol or rectified spirit under open general licence. The exports of these items were hitherto canalised through the State Trading Corporation.

The exports of these items will now be allowed under OGL on production of clearance certificate issued by the Commissioner of excise of the State in which the product to be exported has been manufactured. The same applies to the exports of rectified spirit of any proof degree whether de-natured or not.

The exports of the above mentioned products will be allowed only for shipments to be made on or before June 30. The ministry made it clear that no shipment will be allowed after that date even in cases where the prospective exporters might have entered into firm deals.

The Commerce Ministry was under pressure for some time now from the main sugar cane growing States like Bihar, Uttar Pradesh for decanalising the exports of molasses. The States apprehended that in view of the bumper cane crop the Government should encourage the exports of these by-products of sugar.

It was also pointed out by the States that STC was not putting its best to increase the exports of molasses, The ministry of Petroleum and Chemicals too had backed the demand of the States for decanalisation. (Indian Sugar. 28(9); 1978; 595-596)

199 Fish meal exports

As per a new notification, the Government of India have allowed free export of fish meal with protein content of 60% or above without quantitative restrictions. Fish meal with protein content of 50% and above but less that 60% will be allowed to be exported within a limited cieling. (Seafood Export Journal. 10(12); 1978; 37)

200 Imports of raw cashewnuts

Year	Imports	
	Quantity (000 tonnes)	Value (Rs. lakhs)
1975-76	137.20	3355.8
1976-77	75.12	1833.0
1977-78*	60.19	1872.0

*Provisional

Source:- D.G.C.I. & S., Calcutta Customs Houses.

(Industrial Development News. 13(12); 1979; 175)

201 Exports of Oilseeds, Oils and Oilcakes from India
(April 1976 to March 1977)

	Quantity (tonnes)	Value (Rupees)
Oilseeds		
Groundnut Kernel H.P.S.	1,22,806	59,39,53,734
Groundnut Shelled H.P.S.	1,36,539	65,24,15,078
Mustardseed	12	55,956
Nigerseed	9,441	2,46,69,028
Sunflowerseed	2,547	38,53,842
Sesamum	276	5,08,570
Total	2,71,621	1,27,54,56,208
Oils		
Groundnut Oil	2,905	1,68,30,909
Sunflowerseed Oil	33	2,38,930
Rape & Mustard Oil	84	4,45,965
Linseed Oil	42,087	18,43,90,885
Linseed Oil boiled	174	15,12,428
Coconut Oil	6	34,402

(Contd.....

Castor Oil	40,961	22,02,39,795
Mowra Oil	151	17,60,708
Tobacco seed Oil	31	42,02,696
Kokum Oil	242	48,92,167
Sal Oil	1,833	2,44,30,084
Others	1,640	1,46,99,698
Hydrogenated Groundnut Oil	1,070	86,73,716
Total	96,057	49,31,32,778
Oilcakes		
Deoiled Rice bran	4,10,817	23,14,43,377
Decorticated Cottonseed Oilcake	65,127	8,52,24,235
Undecorticated Cottonseed Oilcake	5,755	66,56,797
Linseed Oilcake	25,867	2,97,66,169
Nigerseed Oilcake	18	52,151
Sesamum Oilcake	1,341	16,05,777
Other Oilcake & Oilcake meal	2,683	27,67,335
Solvent Extracted Copra Oilcake	4,686	34,81,595
Solvent Extracted Groundnut Oilcake	12,34,417	1,68,39,43,998
Solvent Extracted Linseed Oilcake	1,21,133	14,14,59,100
Solvent Extracted Decorticated Cottonseed Oilcake	1,00,435	12,39,77,574
Solvent Extracted Undecorticated Cottonseed Oilcake	2,155	19,45,172
Solvent Extracted Kardi Oilcake	43,767	2,82,32,733
Solvent Extracted Niger Oilcake	11,013	95,60,480
Solvent Extracted Sesamum Oilcake	5,774	89,65,217
Defatted & deoiled Oilcake meal	1,02,858	11,05,00,244
Compound animal feed	45,863	6,26,68,973
	21,83,709	2,53,22,50,927

(Oils and Oilseeds Journal. 31(2); 1978; 32)

202 Cash aid for Exports

The Union Cabinet has decided that the rates of cash assistance for exports would be fixed in multiples of 2.5 and that they would generally vary from 5 to 20%. It has also been decided that while fixing the rates the need to compensate for discriminatory freight rates and to stabilize prices of each important agricultural commodity shall be taken into account.

The Cabinet has asked the Commerce Ministry to ensure that cash assistance is not ordinarily given for traditional exports with established markets. Further, cash assistance should be subject to periodical reviews by committees, which must meet every two months.

Based on these decisions, the Commerce Ministry has announced rates of assistance for 61 items. Rates in respect of another 76 items have been finalized and will be announced soon. (Industrial News Digest 2(5); 1979; 6)

203 RBI Relaxes restrictions on trade with Pakistan

The Reserve Bank of India has relaxed its restrictions against opening and advising of letters of credit by banks in India in regard to trade between Pakistan and India. Accordingly henceforth, any authorised dealer in foreign exchange in India may open letters of credit in a convertible currency against imports from Pakistan to India or advise letters of credit opened in a convertible currency against exports from India, subject to the normal Exchange Control regulations being observed. (Indian Sea Foods. 13(4) & 14(1); 1978; 32)

204 Trade and payments agreement with people's Republic of Bulgaria

A new Trade Agreement with people's Republic of Bulgaria has come into force on January 1, 1979 and will remain valid initially for a period of three years upto December 31, 1981.

The Trade Agreement envisages that all trade and payments transactions between India and Bulgaria from January 1, 1979 shall be

concluded and settled in any freely convertible currency mutually agreed upon between the individual contracting parties in accordance with the foreign exchange laws, rules and regulations of the two countries. However, payments falling due after December 31, 1978 in respect of all export/import contracts/agreements concluded between India and Bulgaria before January 1, 1979 will continue to be implemented in non-convertible Indian rupees in accordance with the terms of the relevant contracts other than those on deferred payment terms of the relevant contracts other than those on deferred payment terms, shall be completed before December 31, 1979. If some contracts/agreements concluded before January 1, 1979 still remain unsettled on December 31, 1979, the two Governments may mutually agree on the dates by which these contracts/agreements shall be settled. (Spices News letter. 13(3); 1979; 7)

205 Trade promotion office at Tokyo

The Marine Products Export Development Authority has opened a Trade Promotion Office at Tokyo. Mr. R.R. Singh till recently under Secretary to the Government of India in the Ministry of Commerce, New Delhi, has assumed office as Resident Director. The address of the office is as under:-

The Trade Promotion Office,
MPEDA, Third floor,
No.1, Marutaka Building,
6-16-12, Ginza, Chuo-Kuku,
Tokyo.
Tel.No. 363-0435

Japan is the largest market for Indian frozen shrimp. During 1977-78 Indian's exports of Shrimp to Japan were of the order of Rs.1,090 million. Next to Iron ore, frozen shrimp is the largest export commodity from India to Japan. (Indian Seafoods. 13(4) & 14(1); 1978; 31)

206 DCCI & Office at Gauhati

Office of the Deputy Chief Controller of Imports and Exports, Gauhati (Assam) has started functioning with effect from 14th February, 1979. The address of this office is as under:-

Office of the Deputy Chief Controller of Imports & Exports,
Rajgarth Road, Gauhati-781 003.

(Spices News Letter. 13(3); 1979; 7)

FOOD LEGISLATION, QUALITY CONTROL AND HYGIENE

207 Standards of weights and measures rules

The date of implementation in respect of the new provisions of the Standards of Weights and Measures (Packaged Commodities) Rules, 1977 has been extended by a further period of six months. Consequently, these provisions which were to come into force on February, 1, 1979, would now become operative from August 1, 1979.

These provisions relate, among others, to packaging in rest rationalised standard quantity, area of the principal display panel and size of the letters used in the mandatory marking, prohibition of deceptive packages and of the use of vague and misleading nomenclature such as, Jumbo', 'giant', 'king' etc., This extension has become necessary to enable the Government to examine in depth the various representations on the Rules received from different sectors of trade and industry and take a final decision on them.

It is recalled that the other provisions of the Rules relating to mandatory marking on the package in regard to the name of the commodity, the name and address of the manufacturer or packer, the net contents, the date of packing and the price, have already come into effect from September 26, 1977. (Economic & Commercial News. 9(7); 1979; 11)

208 Pulses, edible oilseeds order amended

The Union Government amended the pulses, edible oilseeds and edible oils order suitably on Feb 1 to make it foolproof. An Official

spokesman said that the amendment was made following representations from various state governments about the difficulty in implementing the original order which was issued on Nov 21, 1977. Under the new dispensation, producers will include persons who purchase unprocessed pulses and edible oilseeds and edible oils, process these pulses or manufacture oil from the seeds and oils and sell those processed stuff to a wholesaler or through commission agents.

Secondly the original order did not provide for stock limits of a dealer who also carried on business as a producer or as a commission agent. In the amended order the position has been made clear. A dealer, who is also carrying on business as a producer or a commission agent, shall be entitled to retain stock limits specified for each business if business accounts which relate to it are kept separate from one another. Thirdly, it has been provided in the new order that the stock limits would be related to the maximum quantity of the raw material to be used or the finished product held during any one of the three years ending on October 1977.

This is mainly to cover those mills, which for various reasons like adverse seasonal condition, labour unrest and the like could not work to optimum capacity during the year ending Oct 31, 1977, which was the period of reckoning provided for in the earlier order. In case of a new mill which had commenced production subsequent to the issue of the original order, stock limits would be related to the annual installed capacity.

In the fourth place, regarding stock in transit, it has been clarified that it should be treated to have been included in the stocks of the dealer in whom the property in such quantity is retained during such transit in accordance with the terms of any contract or agreement in pursuance of which the quantity is in such transit. Sources close to the Commerce Ministry maintain that the order would strike a blow on the hoarding of pulses, edible oilseeds and oils. (Indian Economic Dairy. 9(7); 1978; 5726)

209 Tests show no harm by glutamate

After injecting fetal monkeys with up to 16.6 g monosodium glutamate (MSG) per kg body weight, Dr. W. Ann Reynolds, University of Illinois, found no damage in the hypothalamic region of the monkeys' brains. Reporting to a symposium May 29 - 31 at Mario Negri Institute of Pharmacological Research, Milan, Italy, Reynolds stated the monkey fetus is a very good model of the human fetus and exhibits a glutamate-impermeable barrier between blood and brain.

Dr. L.J. Filer, University of Iowa, gave results of feeding and injecting infants form 11 days to 11 months old with sources of glutamate and aspartate. None of the babies showed unusually high blood levels of either amino acid, so Filer concluded they metabolized glutamate and aspartate rapidly.

Dr. Silvio Garattini of Mario Negri Institute confirmed that no increase in brain glutamate concentration occurs, even when massive ingestion of MSG raises blood glutamate levels.

Dr. Alistair Worden, Huntington Research Centre, Cambridge, England, found no toxic effect in dogs or rats fed high doses of MSG over two years. (Food Product Development. 12(8); 1978; 91)

210 Vegetable oil cancer link

During a symposium on controversies in nutrition at Hyannis, Mass., Dr. Joseph Vitale, nutrition pathologist at Boston University School of Medicine stated that diets rich in polyunstrurated (Vegetable) fats "appear to lose natural defenses to the disease when placed on diets in which polyunsaturates comprise 20% of daily intake of calories." He noted that it's not unusual for many people normally to consume 20% fat as polyunsaturates. "When patients are returned to a diet containing both saturated fat and 8 to 9% polyunsaturates," Vitale concluded, "they return to their previous state of immune competency.

At the same symposium, Dr. George V. Mann, Vanderbilt University, offered support for Vitale's position, "Highly touted corn oil products contain 15 to 20% unnatural'trans fatty acids', which are suspected as causative link to heart disease," said Mann. "Therefore, people would do better to go back to butter and lard." (Food Product Development. 13(1); 1979; 52)

211 Cancer-causing agent in beer

Nitrosamine compounds were present in some American beers in amounts of 2 to 3 parts per billion.

The U.S. Department of Agriculture has said that under certain conditions, nitrosamines have been found to be Carcinogenic. (Food Nutrition and Health. 2(6); 1978; 2)

212 Special fungistatic coating

For over eleven years food processors throughout the world have been effectively controlling the troublesome problem of bacteria and mold growth by using a special fungistatic protective coating. Called Steridex, the coating has proved to be effective in bakeries, breweries, food processing plants, mushroom farms, and even in hospitals.

This paste-like plastic membrane coating, provides several advantages over conventional coatings. (Food Engineering. 3(10); 1978; 68)

213 Dishwashing liquid

Mop is a dishwashing liquid for utensils, pots, pans, crockery and glass. It penetrates below the dirt, frees it from the surface, suspends it and prevents it from settling again on the dishes. (Industrial Products Finder. 7(7); 1979; 21)

214 Moisture-controlled cooker features continuous cleaning

The cleaning operation in this newly-available cooking system is

unique in that it operates continuously throughout the cooking process. Water maintained at a cool 190°F is circulated through the hollow bottom pan shell. This constant cooling eliminates food burn-on and minimizes sticking to both the pan bottom and the conveyor. As the conveyor returns underneath the oven, it is sprayed with hot water from the cooling system, thus preventing buildup. For complete cleaning, special built-in spray nozzles are activated to wash the unit from the inside. Typical cleaning time is about one hour.

Cooking in this newly-available system is accomplished by the turbulent flow of a moisture-controlled oven atmosphere. This seals in the product's natural moisture and protects against lost weight and flavor. This lack of dehydration results in a higher yield of product and better nutrition, appearance, and taste. When used in conjunction with pre cooking equipment, excess oil and greasiness, such as that found in the total frying of meat patties and poultry parts, is eliminated.

The system is designed for easy maintenance and inspection, and operates with either gas or electricity. (Food Engineering. 3(10); 1978; 116)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

215 Appropriate industrial technology

A two-part International Forum on appropriate Industrial Technology is being organized jointly by UNIDO and the Government of India. The Forum will be the largest conference ever convened to identify industrial technology appropriate to the specific needs of developing countries and the transfer of such technology to these countries.

The first part of the Forum, to be held at New Delhi from 20 to 25 November, 1979, will bring together 300-500 public and private decision makers, technical experts and representatives of research institutes

concerned with the practice and application of appropriate technology. Apart from the conceptual and policy framework for appropriate technology in developing countries, the meeting will discuss the application of appropriate techniques and processes in 12 sectors, viz. agricultural machinery and implements, food storage and processing, light engineering and rural workshops, energy for rural requirements, low cost transport for rural areas, paper products and small pulp mills, basic industries (steel, fertilizers, chemicals etc.), sugar, textiles, oils and fats, cement and building materials, and drugs and pharmaceuticals.

The second part of the forum will be a conference of ministers from some 40 developed and developing countries which will consider the policy implications of the conclusions reached by the first meeting. The ministerial conference will take place from 28 to 30 November, 1979, at Anand, Gujarat. (Industrial News Digest. 2(5); 1979; 5)

216 Baby food unit for Rajahmundry

A baby food (milk powder) factory, said to be one of the biggest in Asia will be set up at Rajahmundry at a total cost of Rs.12 crores. It would produce 40 tons of baby food powder per day utilising four lakh liters of milk. The factory would be set up in two stages and in the first stage, 25 tonnes of baby food would be produced by utilising 2.5 lakh litres of milk per day. (Indian Dairyman. 31(1); 1979; 70)

217 Rice mills

The Food Corporation of India has decided to set up five more modern rice mills in Andhra Pradesh, at an estimated cost of about Rs.1.50 crores.

The four modern rice mills set up by the Corporation at Nellore, Sattenapalli, Miryalaguda and Nizamabad are functioning satisfactorily.

The five mills, with a four-tonne per hour capacity each, would be started in Karimnagar, Khammam, Krishna, East Godavari and West districts. (Industrial Development News. 13(10); 1978; 129, 130)

218 Fruit concentrate

A fruit concentrate project with foreign collaboration is proposed to be set up at Silchar in Cachar district of Assam, involving an investment of Rs.6 crores. German Democratic Republic would collaborate in the project.

Fruits from the entire north-eastern region would be brought to the plant for production of concentrates for both domestic and foreign markets. (Industrial Development News. 13(10); 1978; 127)

219 Tryptophan production by fermentation

Sorigona, a subsidiary of the Swedish Sugar Corporation, is shortly to begin commercial production of L-tryptophan, by fermentation.

The process was jointly developed over ten year by sorigona and Bofors Nobel Kemi and is the first tryptophan fermentation process to be used commercially. Strain selection and mutation led to the development of a yeast, Candida humicola, which leads to economically recoverable quantities of L-tryptophan after 60 to 70 hours fermentation at 30°C in a solution based on indole and sugar. The amino acid is extracted, using centrifuges and ion-exchangers, and crystallized several times to obtain the required degree of purity.

Conventionally, L-tryptophan is produced by organic synthesis with phenyl-hydrazine, acetaminomalonic ester and acrolein as raw materials. (Indian Chemical Journal. 13(9); 1979; 44)

220 Vitamin C plant

Maize products is planning to set up a Rs.1.5 crore Vitamin C plant at Ahmedabad. The company possesses an industrial licence for manufacture of ascorbic acid, sodium ascorbate, and calcium ascorbate at the rate of 250 tonnes per year. (Industrial Development News. 12(8); 1978; 106)

221 Salt

The Union Government has approved the proposal for the establishment of a new undertaking, viz., Solar Salt Works in Jodia (Gujarat) for the manufacture of 3.50 lakh tonnes of common salt annually. (Industrial Development News. 12(8); 1978; 106)

222 Soybean biscuit unit in Madhya Pradesh

The Madhya Pradesh Government has decided to set up a soybean biscuit plant in the state with a capital of Rs.15 crores. The output would not only meet the requirement of the country but would also earn a huge foreign exchange. (Economic Times. June 13, 1979)

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* * * * * *

STORAGE

223 Ice storage bin

Model B120 ice storage bin handles upto 860 lbs of ice per day. It also accomodates the HL 1200 cubes which has a 1,325 production capacity. Optional divider separates bin into 2 compartments, one for flake ice the other for cubes. Models B x 128 and B x 113 increase the B 120's storage capacity by 720 lbs and 350 lbs. (Climate Control. 2(4); 1978; 9)

224 High temperature method of disinfecting grain

A rapid high-temperature method of disinfecting grain at export terminals and country silos is being developed. The plant uses two fluidised beds, one for heating and the other for cooling. Air is forced into the grain to heat to about 60°C in 4 min. In the cooling chamber water is sprayed into the surface of the grain. The heat in the grain evaporates the water, the vapour passes into the air stream, thereby speeding the cooling process. (Documentation Bulletin. 35; 1979; 33)

225 Glue trap for rats is non-poisonous

The glue traps for rats and mice are non-poisonous and ecologically safe for use in all areas of a plant. The traps catch rodent stays on the trap, it does not run off to die in walls or machinery as may be the case if it is the victim of poisoned bait. The trap trays are molded of non-porous plastic and contain a special glue. The consistency of the glue prevents it from leaking out of the tray. The traps measure 5 x 10 inches and are $\frac{1}{2}$ inch high. (Food Engineering International. 4(6); 1979; 73)

FOOD ADDITIVES

226 Soybean oil simulates bacon flavor

Partially hydrogenated soybean oil, supplemented with smoke and other natural flavourings, simulates the true taste of bacon. Charoil B is recommended for use as flavoring in meat analogs, bean products, soups, snack foods, frozen foods, salad dressings, and canned meat products. According to application tests, 0.5 to 2.0% is sufficient to impart a desirable bacon flavor. (Food Product Development. 12(11); 1978; 55)

227 Frozen food release coating oil

The food release coating oil prevents food from sticking to surfaces at temperatures to blow 0°F. The product, designated F-120, has non-stick application on belts, trays, bands, molds, and mesh conveyors. F-120 may be used with frozen dairy products, processed meats, vegetables, fruits, bakery products, etc. This is an all-vegetable coating which meets all USDA and FDA requirements. (Food Engineering International. 4(1); 1979; 84)

228 Cocoa-replacer

A cocoa-replacer offering all of cocoa's flavour, bulk, colour and texture at substantial cost savings has been introduced. The product named as Cocoa-Max is based on soy flour. Unlike other products used to replace cocoa-such as carob powder this does not change the cocoa flavour. This highly desirable characteristic allows Cocoa-Max to replace up to 50 percent of the cocoa in a variety of uses, applications and formulations with little or no alteration of natural finished product flavour.

The product is being utilized in compound coatings by the confectionery and ice cream industries, as an ingredient in chocolate

cakes and cake mixes, icings, and in chocolate clips for cookies. (Food Engineering International. 4(1); 1979; 14)

229 Alcohol flavorings

Maderia Concentrate imparts the flavor of fine wine, a blend of citrus oils, and slight buttery tone to foods. Ingredient may be used to improve or increase flavor strength in products such as cakes, pastries, cookies, sweet dough, fillings, and centers. In addition, its estimated cost, less than $\frac{1}{4}$ cent per pound of finished product, represents significant savings to bakers and confectioners.

The improved rum and brandy flavor blend, concentrated to 20 times the strength of real rum and brandy, is available for use in fruit cakes. Concentration enables bakers to achieve uniform flavor and aroma economically over larger amounts. It also assures against freeze out or weakening on the shelf. Ingredient is available in both powdered and liquid forms. (Food Product Development. 12(6); 1978; 40)

230 Phosphate-lemon improves meat flavor

Lemo-Fos provides a chemical combination of phosphate and lemon juice for use in meat products. According to TBA tests, application of the new, liquid ingredient blend significantly extends product shelf life. Up to 12 weeks storage of intact primal cuts is possible. In roast beef, for example, Lemo-Fos prevents free radical formation and rancidity development. As a result, no warmed-over flavor is evident. (Food Product Development. 13(2); 1979; 48)

231 Encapsulated glucono-delta-lactone (GDL) for sausage

By using a special method to encapsulate glucono-delta lactone (GDL), Durkee Foods has created a controlled and precise method of release to lower the pH in a sausage product.

Durkote GDL 135-50 (patents pending) contains 50% GDL which is encapsulated with a hydrogenated vegetable fat and will melt when

a temperature of 135° F is reached in the smokehouse. Once the GDL is released, it will quickly hydrolyze to form gluconic acid, thereby creating the desired pH. The final pH of the product depends upon the moisture-protein ratio of the meat product as well as how much encapsulate GDL was added initially.

The maximum amount of GDL allowed in fermented products by the USDA is 0.5% in 100 pounds of meat. This is attained by adding one pound of encapsulated GDL to 100 pounds of meat mix. (Food Engineering International. 3(12); 1978; 49)

232 Yogurt benefits from pure fructose addition

Crystalline fructose permits construction of a dry powder base for instant yogurt mixes. Sweetener reduces sugar content of frozen yogurt by 50%, enhances fruit flavors in the acidic product, and adds to smooth texture. By using pure fructose, manufacturers can produce portioned mixes or institutional product bases which can be hydrated, incubated, frozen, and served. (Food Product Development. 12(6); 1978; 40)

233 Dispersion agent suited to natural colorants

A new liquid dispersing agent suitable for organic colorants in a variety of foods and beverages has been developed by PVO International. Trade marked Drewpol 10-1-CC, the new agent consists of a polyglycerol ester with relatively high hydrophile - lipophile balance and water solubility. Ingredient is less limited in food use than ethoxylates and more versatile that solid dispersing agents such as the glucoside, sorbitol, and mannitol fatty acid derivatives. Manufacturer recommends application as a dispersing agent for natural vegetable colors including carotenoids and xanthocyanins. (Food Product Development. 12(11); 1978; 55)

234 Vitamin E-based anti-oxidant for foods

A new versatile anti-oxidant based on Vitamin E used widely as

an anti-oxidant for oil and fat products in the food processing field has been developed. Although Vitamin E is soluble in fats and oils, it can hardly be utilized for processed foods containing water. The new anti-oxidant developed endeavours to solve this problem. The new product dubbed as 'D-mixed-E' is a new type of anti-oxidant usable for all processed foods and has demonstrated excellent properties from the view point of processed foods quality, stability and safety. It is manufactured by mixing by a special process natural Vitamin E and alanine, one of the amino acids. The new product therefore, is an emulsion-type anti-oxidant for versatile use in food processing. (Indian Chemical Journal. 13(10); 1979; 27)

235 Vegetable protein coatings extend shelf life

Freeman Industries, Inc. recently released a line of stable vegetable protein coating and granulating solutions for food applications. These solutions provide good moisture protection when glazing confectionary products plus extended shelf life due to the protein's effective oxygen barrier action. Nuts, when vegetable-protein coated, resist rancidity, and vitamin-mineral encapsulation of grains (like rice and specialty cereal products) becomes feasible. G-20 Solution (20% solids) is effective for hardening granulations without adding appreciably to disintegration time, while F-20 employs a second organic solvent for quicker evaporation in film coating. CFR-20 Solution (color and fat reduced) is available when lower color and vegetable fat percentages are desirable. Cost of these products is competitive. (Food Product Development. 12(11); 1978; 55)

PROCESSES

236 Grain processing and handling

The U.S. Grain Marketing Research Laboratory has conducted experiments on improved techniques for handling, conditioning and storing grain.

In grain drying experiments, factors under consideration included energy use, drying capacity and maintenance of grain quality. It was discovered that solar heat added to natural air drying systems contributed 4 to 23 percent more drying then natural air drying.

In one project a combination solar collector and rock pile heat storage unit was constructed. According to the report - "This system caused the period of maximum temperature rise in the drying air to occur four hours after sunset and maintained a high grain temperature throughout the night. The effectiveness of the system increased with seasonal cold weather and resulted in 16 to 30 percent more drying than natural air systems".

Research into measuring and controlling grain dust has shown that " as dust control systems become more sophisticated, the need for dust management becomes necessary. A logical approach towards dust management is to treat grain dust as a by-product that can be used as feed, fuel or fertilizer".

Experiments conducted on ways to reduce damage to grain from process handling discovered that broken grain fills storage areas in a non-uniform manner which causes a higher resistance to air flow than does whole grain. This, " contributed to bacterial activity and hot-spot generation in a grain mass". (Processed Prepared Food. 148(4); 1979; 74)

237 Water conveyor system to clean and to cool tomatoes

A new method of cleaning, cooling, and conveying tomatoes through the packing plant without the slightest damage to the fragile fruit is now available. The tomatoes are cleaned and cooled as soon as they are picked. Damage cannot occur during the cleaning and cooling process. Labour savings are considerable in washing and moving the tomatoes. Tests have proved that the tomatoes keep for a longer period when treated in this manner.

Serving as a water conveyor, the new system consists of an aluminum rectangular-shaped channel lined with PVC sheeting, a centrifugal pump with pressure and suction lines, an elevator and a dryer. Circulating water creates a current in the 19½ foot long channel. This current carries the floating tomatoes to the suction end of the channel, near the grading apparatus. The elevator then lifts the fruit to a dryer. When they leave this machine, the tomatoes are virtually dry and can then be graded by color and size. (Food Engineering International. 3(12); 1978; 90).

238 A new peeling method to replace caustic soda

A new method of chemically "peeling" fruits and vegetables has been introduced in USA and Europe. The new method originally developed in France by Establishment du Peroy (which developed the process and holds the patents) is now on commercial trial in a big way with the American Can Company in USA.

The key to the new process is a formulation that requires no neutralisation and that leaves peelings as a by-product that can be sold as such for animal feed rather than left to become a solid-waste disposal problem. This is a big advantage over the caustic-soda peeling process, currently employed by food processing industry, wherein peelings become a solid-waste disposal problem. The major active compound in the formulation is a blend of diammonium phosphate and a series of surfactants. Concentration varies according

to the fruit or vegetable involved-thin-skinned products, for example, might be processed in a 3% bath, thicker-skinned produce might require 10%.

The new technique is already in large scale use in Europe and can be applied to root vegetables and fruits, such as peaches, apricots, pears, and citrus fruits. The American Can Company is running pilot-scale trials on tomatoes and is optimistic about this new application. In Europe, caustic-soda is already banned for food handling, because of its caustic effect on employees.

American Can Co. expects that the new process (dubbed as "Ampeel") will become economical in future. Although, at present Ampeel formulation is 3 to 4 times higher in cost vis-a-vis caustic soda, advantages of the Ampeel system will cut the relative costs down, to make the method with caustic obsolete in future. For example, the Ampeel system is only mildly alkaline, so bath water effluent requires no neutralization. (Indian Chemical Journal. 13(8); 1979; 33)

239 Enzyme treatment to remove 'Beany' flavour of soybeans

A palatable acid-soluble product from soybean protein than can be used to fortify soft drinks has been developed.

The soybean protein is hydrolyzed with penicillium da Ponti acid protease immobilized on collagen with 10% glutaraldehyde. The collagen membrane bearing the immobilized enzyme is wrapped into a cylindrical module with an interweaving support material and placed in a tubular reactor. The process conserves the sensitive amino acids, typtophan, methionine, theronine and lysine.

The hydrolysate produced by the new process lacks the bitter taste and 'beany' flavour of soybean products and is compatible with the pH 4.5 of the nutritionally fortified soft drinks in which it may be used.

This new process should be of particular value in making soybean products acceptable in India. (Indian Chemical Journal. 13(10);1979;28)

240 Separate adjunct fermentation increases brewery production

An entirely new system for separate adjunct fermentation will have significant impact on the world's brewery industry. Pilot plant tests indicate capacity increases of at least 50%. Equally important, savings can be obtained not only in wort boiling but also in brewhouse and storage space. The new process is based on a completely separate fermentation plant, operating in parallel with the conventional system. Here, a carbonated alcohol solution is produced by fermenting a sugar solution. Instead of mixing malt with adjunct in the brewhouse, the malt is brewed, fermented and stored in the traditional way without adjunct. Both products, the pure malt beer and the adjunct beer, are then mixed either before or after filtering and can then be bottled immediately.

Advantages of the new process are obvious: Separate processing allows an adjunct sugar solution to be fermented very rapidly and easily by increasing yeast concentration and temperature. Another benefit is that there is no need for storing the adjunct beer because of its very low protein content. Moreover, the method can easily be used as a high gravity process.

Key to the system is a new closed continuous tube fermenter called Alferm. Designed and built by Alfa-Laval, it is unusually compact in size, requiring a floor space of only 25 to 30 m^2. Fermenter volume of the pilot plant at warby is 2 m^3, flow rate 10 hl/h, fermentation time 2 h, and fermentation temperature 20°C. Yeast concentration is as high as 25 to 30% by volume.

An interesting aspect is that the pilot is housed in two containers. This enables trial runs to be carried out immediately at any brewery. (Food Engineering International. 3(9); 1978; 50)

241 Thermostable alpha-amylase

A new alpha-amylase enzyme with excellent thermostability and essentially no proteolytic activity has been developed for the food

industry. Taka-Therm can be used in scrap candy recovery, in the production of precooked cereals to reduce the viscosity of cereal prior to roll drying, and in brewing processes to liquefy adjuncts and remove starch haze. Other applications include liquefaction of starch fermentation media, mash liquefaction in distilling processes, reduction of viscosity of chocolate syrups and high viscosity starch slurries, production of substrates for dextrose manufacture or further enzyme conversion, and for cleaning starch processing equipment. Since it is a low protease-enzyme, Taka-Therm minimizes color problems caused by protein hydrolysis during starch conversion. Additionally, its superior thermostability permits application in starch liquefaction systems employing high temperature.

Derived from Bacillus licheniformis, Taka-Therm is a food-grade bacterial alpha-amylase which converts starch, amylose, and amylopectin to soluble dextrins and small quantities of glucose and maltose. The brown, non-viscous liquid is completely water soluble with optimum pH range of 5.5 to 7.0. Optimum temperature range is 80 to 95°C. (Food Product Development. 12(11); 1978; 55)

242 Hydrolysis of peanut protein

In New Orleans, peanut protein was successfully processed by using papain, ("immobilized enzymes" system,) which only partially hydrolyzes the protein molecules.

Papain was not even spent when it completed its work. When more protein was added to the already partially hydrolyzed batch, the enzyme again went to work, partially hydrolyzing the protein and then, very reliably, stopped.

The research team has not tried papain as a hydrolyzing agent for soybean protein, but did try it on cottonseed protein. Because the cottonseed proteins were much less soluble in a water slurry, the amount of protein hydrolyzed was less than that for peanuts. (Journal of the American Dietetic Association. 74(1); 1979; 27)

243 Pea-Protein Concentrate

Research conducted at the University of Saskatchewan, has successfully developed a process for the fractionation of yellow field pea into protein concentrate, starch, fiber, and a modified pea flour.

The process is fairly simple. Briefly, a "unique" dry-milling Process grinds the raw, dehulled field peas into flour. The flour is carried pneumatically to an air classifier which fractionates it into protein concentrate and starch. This is possible because of the difference in size, shape and density of the starch granules and the particles containing protein. The three resulting product lines are pea-protein concentrates, modified pea flours and starch.

High-protein white and whole-wheat breads containing pea-protein concentrate are said to have excellent flavor, color and loaf volume.

Pea-protein concentrates may be used in the fortification of cookies, biscuits, cakes, pancakes, muffins, crackers, other snack foods, non-dairy drinks, pastas and hydrolysates for flavor enhancement of meat and fish products, infant foods, cereals, confections and pet foods. (Food Engineering International. 4(2); 1979; 23)

244 Coconut oil from fresh nuts

A new coconut (oil-seed) oil milling process has been developed, which is claimed to be economically superior to the old method of making copra because the oil is extracted directly from the fresh nut. Further advantages are that the mill is smaller than usual and transportation and storage costs are lower. The quality of the product is high, with almost 100 percent utilization of the coconut. The energy to run the mill is produced by a combination of a power plant using a waste-heat boiler and a steam-turbine generator and the conversion of the coconut water into alcohol. A pilot plant has already been successfully operating for a year in Philippines. (UNIDO Newsletter. 130; 1979;4)

245 Fat crystallization

A crystallization process for the production of full-fat powders has made it possible to pulverize fats. The process causes no changes in the properties of the fat, but the molecular structure is changed. This process preserves the original properties of the raw material and prevents oxidative reduction of the fat.

In addition, the crystal-fat-powder-process has the advantages that it allows the material-compatible addition of fats to all powdered carrier substances; it makes possible the production of highly concentrated mixtures of fat powder; and the simpler and cheaper storage and transportation of perishible foodstuffs is achieved by elimination of refrigeration in many products.

The product consists of fat crystals with smooth unbroken surfaces that carry the finely grained crystal fat powders. In process, the particles of fat are finely atomized and crystallized at sub-zero temperatures after which they are proportioned, matured and weighed off to get the exact quantitative ratio with the carrier substance.

The resultant powder has a particle size of about 50 microns which makes it particularly useful for continuous mixing processes. In addition, this fat powder is free of any denaturing substances. If desired, the fat may be treated with antioxidants to further protect against oxidative decomposition. If emulsifiers are added, the range of applications is increased. (Processed Prepared food. 148(4); 1979; 74)

246 Sweet potato chips

Research in the USA at the University of Maryland has produced a sweet potato chip with acceptable colour and appearance. The secret is a process which removes nearly all sugar prior to frying.

A method to extract 90-100% of the sugar in sweet potato slices before the product is fried has been developed. A delicious, pleasant-colored, snack chip which is more nutritious (high in vitamin A) than white potato chips is produced.

The procedures-diffusion-extraction methods are receiving increasing attention as a way to extract fruit juice and natural plant pigments. The technique improves the recovery of soluble plant products, greatly reduces soluble waste and provides high quality vegetable fiber as a by-product. It can also reduce the sugar content of white and sweet potatoes intended for chipping and other deep-fat frying uses. (Food Engineering International. 4(5); 1979; 28)

247 New roasting process for coffee

The key to high yield coffee is a new coffee-roasting process which expands the cellular structure of each coffee bean by as much as 20%. Since more surface area of each bean is exposed, this allows more flavour and aroma to be released. Subsequently, more coffee can be made from the same number of beans with the same per-cup flavor-but at a substantial savings. The process actually roasts coffee beans deeper. The green coffee is roasted under intense heat applied at a very high velocity. The combination of heat and force rapidly expands the cell structure, enabling the heat to actually reach deeper into the bean. The "tricky" part to the whole process, is keeping the beans in this expanded form. Rapid cooling accomplishes this. Rapid-cooling is accomplished in three stages: (1) because the beans are expanded, there is a reduction in the amount of coffee in the cooling section at any given time; (2) the dwell time through this section has been increased; and (3) there is an increase in the velocity of cooled air. Finally, precision grinders are used, insuring that the beans do not crumble during this stage of the process. Consumer taste tests show that high preference rates are equal to all leading brands of coffee. (Food Engineering International. 4(1); 1979; 25)

248 Direct immersion freezing

Using a liquid freezant composed of 15% table salt, 15% ethyl alcohol (ethanol), and 70% water, it was possible to experimentally freeze carrot dice, peas, and other particulate vegetable products. The per-product-pound energy requirement using this technique is about 25% less than that using a conventional air-blast freezer. The saving is due to the high heat transfer coefficient (50-150 Btu/hr $ft^2.{}^oF$), compared to 8 Btu/(hr.$ft^{2.8}F$) for blast freezerair, and the high heat capacity for the liquid freezant. Further more,, freezing was accomplished in just two minutes, instead of the 25 minutes' exposure required by blast freezers. (Food Engineering International. 3(12); 1978; 44)

BYPRODUCTS AND WASTE UTILIZATION

249 Ethanol from bagasse hydrolysate

In view of the present energy crisis, novel raw materials for production of ethanol are being searched. Enzymatically hydrolysed bagasse in 10 percent suspension contains 6-7 percent by weight total reducing sugars; it offers an excellent raw material for ethanol production. A novel process has been developed at the Bio-chemical Engineering Research Centre, Indian Institute of Technology, Delhi.

Bagasse hydrolysate obtained from enzymatic process can be used as such or concentrated to 28 percent sugar concentration for ethanol production. The 28 percent total sugar containing stuff corresponds to 20 percent glucose (fermentable sugar). Batch fermentation of this concentrate produces 9.2 percent ethanol representing a 91 percent conversion efficiency.

Production of ethanol from hydrolysate compares very favourably with the traditional method from molasses. The presen

fermentation reduces the time of fermentation to almost half of that required with molasses as raw material. Because of extremely low solid content in this case, fermentations can be carried out at higher sugar concentration resulting in high ethanol concentration in the product. The problems of scaling in the stills are also reduced to a great extent in the present case. (The Chemical and Polymer Times. 7(2); 1979; 5)

250 Mercury eliminated from laboratory wastewater

USDA has developed a simple, inexpensive method to keep mercury containing wastes from Kjeldahl reactions out of laboratory sewage. Each Kjeldahl determination produces about 240 ml (8 oz) of liquid waste with soluble mercury content often above 30 parts per million (ppm) - enough to produce an unacceptable mercury level in 100 gallons of wastewater.

The USDA process requires only standard laboratory equipment and chemicals to complete treatment in less than an hour. Treatment is based on formation of insoluble mercuric-sulfide and its removal by filtration. The five-step procedure produces treated effluent containing less than 0.05 ppm total mercury and helps laboratories meet new, more stringent wastewater standards. (Food Product Development. 13(2); 1979; 66)

251 Continuous system monitors sugar loss

The need for effective monitoring of waste waters from a sugar refinery is obvious; sucrose levels in the parts per million range can easily become a significant sucrose loss in some refinery streams.

Now, samples of two streams of waste water are pumped from two refinery houses to the control laboratory and alternately fed into a self-cleaning filter. The filtered sample is transmitted to the analytical unit, which analyzes for sucrose and displays its concentration along with sample identification on a strip chart. The analytical unit periodically corrects itself for baseline drift, and

will trip an alarm whenever high readings are encountered. The Autoanalyzer measures sucrose colorimetrically to within ±5% in the 10-1000 ppm range, and displays the concentration on a strip-chart recorder. The A.S.P. II clarifier filters samples containing up to 2000 ppm solids. (Food Engineering International. 4(1); 1979; 50)

252 Brewery by-product utilization

The main by-products of brewing are spent grain (called BSG here) which remains after mashing and the yeast removed after fermentation of the wort. BSG, is an inexpensive source of both essential food fiber and protein. It has more protein (26-30%) and dietary fiber (about 40%) than regular flour. BSG can be milled and added to commercial recipes to produce inexpensive and nutritious chocolate chip, oatmeal, molasses, ginger snap, peanut butter and sugar cookies. (Food Engineering International. 4(1); 1979; 21)

PROCESSED PRODUCTS

253 Pea powder/flours

A series of products consisting wholly or partially of field pea powder and flour is now available. It provides a good quality, all purpose flour for use in products requiring a relatively high protein, low cost ingredient. Flour is light green in color, imparts a clean mild aroma, and has fresh flavor typical of high quality field peas. It contains 24.5% protein, 61.8% carbohydrate, 9% moisture, 0.9% fat, and 4.8% crude fiber.

Applications of pea powders/flours range from use in bakery items, cocoa extenders, soups, and confections to meats, pasta products, frozen desserts, health foods, toppings, pancakes, and doughnut mixes. (Food Product Development. 12(11); 1978; 55)

254. Non-carbonated soft drinks fortified with Vitamin C

A USA firm has recently introduced vitamin-C fortified Hi-C soft drinks. These are said to be the first non-carbonated soft drinks in the United States to contain 100% of the USDA Recommended Daily Allowance (RDA) of vitamin-C. (Food Engineering International. 3(9); 1978; 19)

255 Auto fuel from tapioca

More than two dozen by-products are made out of cassava starch. Among these, cassava alcohol, a renewable source of energy can be substituted for petrol.

Cassava alcohol has an additional advantage in that it can be used in cars without much modification of the engine. It reduces air pollution, burns cooler and clear and more efficiently giving virtually the same mileage as petrol without leaving lead or sulphur pollutions. (Indian Arecanut Spices & Cocoa Journal. 2(3); 1979; 85)

256 Milk-based beverage sweetened with high fructose corn syrup

A new, versatile beverage protype containing Isomerose high fructose corn syrup, has been developed. The new beverage employs 3.5% whole milk to which either citric or lactic acid is added; acidifying the product to a pH of 4.1 to 4.5. Addition of lactic acid, produces a flavor similar to that of yogurt without the time-consuming fermentation step. (Food Product Development. 13(2); 1979; 48)

EQUIPMENT & MACHINERY

257 Special nozzle and wand simplifies carcass washing

With a new cleaning nozzle and wand, the need for elevated platforms or ladders to wash carcasses from the top down is eliminated. A curved neck on the end of the shaft concentrates a hot water spray on the carcass, not on overhead conveyors or nearby equipment.

The unit is constructed of stainless steel parts throughout with a replaceable heavy duty black (or white) rubber cover to protect the nozzle from damage. The nozzle comes complete with two spray heads, a chisel type head for a steady fan spray and a standard head stream to a fine spray. Both heads are easily interchanged at the tip of the extension shaft. (Food Engineering International. 3(9); 1978; 90)

258 Germ killing system

This is an electronic system which not only records temperature and humidity but also takes into account the electrostatic biological content of the air. It reduces the bacteria content by 80% in cool rooms where the temperature are about 36° F and 90% humidity. This makes the system ideally suited for the food industry particularly for meat where excessive weight loss and discolouration is reduced. The system can be installed and ready for operation within a couple of hours. (Climate Control. 2(4); 1978; 9)

259 Vitroscope

Vitroscope a tiny wooden maize sheller, has been developed by the Indian Grain Storage Institute. This is very useful to check the vitreousness in wheat. It can be used by bakeries and flour mills to find out whether the wheat is fit for bread making. (Seminar Reporteur. 9(4); 1979; 26.)

260 Humidity indicator

For fast and accurate spot checking in computer rooms, warehouses, grain and paper storages and other applications, a relative humidity indicator has been designed which features dual scale, relative humidity and temperature and built in temperature compensation for greater accuracy. (Climate Control. 2(4); 1978; 8)

261 Precision hygrometer

High-precision laboratory instrument covers the range from 10 to 100% RH (relative humidity) with an accuracy of $\pm$ 2% RH. The highly sensitive hygrometer is capable of detecting changes in humidity of 0.1% RH. Measurements are clearly read on a $3\frac{1}{2}$ - digit display.

The instrument can be switched to either of 2 probe inputs. Features include linear voltage output, measuring circuit check, and simple calibration. (Food Engineering International. 4(5); 1979; 59)

262 Dispenser meters liquids and solubles

A metering device is designed to accurately add liquids or solubles to water or to any other liquid. The Profel liquid dispenser is preset at 0.2 percent, 0.5 percent or 1.0 percent of the main flow. If additives are prediluted, a nearly infinite range of dosages may be dispensed. The dispenser is self-priming and uses no electricity. Maximum flow rate is $6\frac{2}{3}$ gallons per minute. Operating pressure is 3 to 85 pounds per square inch in the primary supply. Applications include water treatment, food preparation and vitamin addition. (Processed Prepared Food. 148(2); 1979; 84)

263 Product filling machine

A ten-pocket volumetric filler has been designed to handle a

wide variety of food products, such as chopped tomatoes, berries, peas, corn, frozen meats, apple chunks, diced vegetables, beans and pasta. The unit will fill product into metal cans, glass jars or other types of rigid containers, with speeds of 250 containers per minute. A vibratory can-track helps to obtain required fill-weight with products of low density. (Food Engineering International. 4(1); 1979; 79)

264 Liquids and dairy products filler

Using a rotary-valve/piston-fill concept, this filler assures in-carton accuracy and drip-free savings. Fill rates of 116 cartons per minute are possible, and the filler will handle cartons ranging in size from 4 ounces to ½-gallon. It will handle milk, orange juice, half-and-half, butter milk, whipping cream and yogurt with fruit particles. The piston-fill design uses but two moving parts per fill station the self-aligning piston and the positive-cutoff rotary valve, which keeps maintenance and replacement costs at a minimum. (Food Engineering International. 4(1); 1979; 92)

265 Biscuit oiling machine

The biscuit oiling machine, features a unique process which employs the biscuit oil itself to wash away particles into a drain while the oil is re-cycled. This provides a more accurate and consistant quality of spraying which is activated through a spinning disc principle. Here, the correct positioning of the guards is essential to retain the mist. The hoods, like all other parts of the machine, are removable for in-depth maintenance and cleaning. (Food Engineering International. 4(6); 1979; 41)

266 Versatile dehulling and milling machine

The Division of Animal Production of the Australian Commonwealth Scientific and Industrial Research Organization (CSIRO) has developed a small portable machine for the dehulling and milling of grain. The principle of operation is simple: the seed is bounced repeatedly

between a rotor and a baffle plate until the impact cracks the husk and frees the kernel. It can be used for dehulling at low rotor speeds and for milling at high speeds. Whole seed, fed into a variable feed hopper at the top of the machine, is struck by the rotor and propelled against the stainless-steel baffle plate. The rotor is cylindrical and a consists of 16 rods. Ripples on the baffle plate deflect the seed back to the rotor. The process continues until the husks crack, releasing the kernels. The dehulled seeds and husks work their way to the bottom and discharge into a vibrating screen, where the husks and chaff are drawn up by suction and the kernels are channelled into a container.

Different types of seeds can be dehulled-such as rice, safflower, oats, cotton seeds, soy beans and sunflower seeds-by adjusting the speed of the rotor to suit each type.

The unit is powered by a 4.8 kw petrol engine and can handle 450 kg of sunflower seeds per hour. (UNIDO Newsletter. 130; 1979; 4)

267 High speed bacon slicer

A continuous bacon slicer capable of producing up to 1,350 uniform slices per minute with minmal silver slices and scrap is now available. The slicer accepts product up to 14 inches wide and 4 inches high, and is equipped with independent tension rollers and guide bars for precise product control. The product can be loaded from either side, and is automatically aligned and fed to the slicer blade.

Plexiglass safety guards are located over the discharge area and on the operator side, and magnetic interlocks are located on all safety guards and slicer door. A thermostatically controlled knife heater warms the blade to insure a cleaner cut, and a blade cover is included for on-the-spot sharpening. (Food Engineering International. 3(9); 1978; 90)

268 Combination of slicer-grinder

This unit gives the processor two machines for the price of one. It preslices frozen or fresh meat, then immediately grinds. Thus, separate prebreakers or shredders are not required. Estimated production is 4,000-15,000 lb/hr, depending on the plate size employed and the product being ground. (Food Engineering International. 4(6); 1979; 54)

269 Multi-purpose mixers

The line of multi-purpose mixers can efficiently homogenize, emulsify or disperse a wide range of materials. A variety of heads are available for each unit to match any application. Depending on the viscosity of the product, volumes ranging from 2 ml to 90 liters can be mixed.

The four-model line includes: a standard laboratory mixer; a heavy-duty mixer; a two-stage unit, which has a head for disintegration of large pieces and a head for fine comminution; and a unit that mixes materials in completely sealed conditions. (Food Engineering International. 3(12); 1978; 93)

270 Automatic can flanger

Vertical design of this automatic machine greatly facilitates flanging both sides of non-circular cans. Utilizing vertical tooling and a continuous belt conveyor, the new system does away with the elevator and turning baskets normally required with conventional horizontal machines. This not only reduces operating noise but also considerably cuts investment costs. In addition, changing from one can height to another is more rapid, and there is no damage to can surfaces.

After leaving the bodymaker, the cans are fed upright to the flanger by the belt conveyor where they are flanged on both ends.

The single-spindle machine can handle tinplate cans with a non-circular cross-section up to 250 mm height. Capacity depends on can size: for 150x150 mm cans it is 80 cans/min, and for 80x80 mm cans an output of 150 cans/min can be achieved. Circular cans up to 189 mm diameter can also be handled. (Food Engineering International. 3(3); 1978; 59)

271 Blanchers for a variety of needs

The rotary screw hot water blancher features a basic stainless steel construction. Precise controls ensure uniform heat throughout the process. This unit blanches most products.

Designed especially for leafy products, such as spinach, broccoli and mustard greens, the draper style blancher totally submerges the product through the entire blanching process. Product is positively conveyed on a belt that receives automatic washing every revolution.

A reel design hot water blancher is available for small products and can be used for processing a number of different products sequentially throughout the year. Key also offers a steam belt style blancher that may be used as a steamer and scalder as well. The steam blancher is especially useful with fragile products such as cob corn, asparagus or spinach. (Processed Prepared Food. 148(8); 1979; 58)

272 Portable power washers

Two portable washers, one which delivers 3 gpm of cleaning solution at 800 psi and the other delivers 4 gpm at 1000 psi, are designed for a broad range of industrial cleaning applications. Typical applications include food processing equipment, material handling equipment, manufacturing areas and docks. Each washer has a three-piston positive displacement pump that is corrosion resistant. The pumps feature a cast iron crankcase, stainless steel piston rods Hastalloy discharge valves, hardened steel connecting rods and drop forged

hardened crankshaft. Units are driven by a heavy duty electric motor with thermal overload protection. The operating components are totally enclosed, but are easily accessible for service. (Food Engineering International. 4(1); 1979; 61)

273 Fluid bed processor removes fines from particulates

This unit separates unwanted "fines" and/or dust from particulate products through the utilization of a special fluidized bed principle. This method of fluidization uses the relfection of jets of air from a non-perforated oscillating conveyor to aerate the particles. Turbulent air scrubbing action strips the unwanted "fines" from the product and conveys them in the exhaust air stream. The suspended "fines" are removed from the exhaust air as it passes through a cyclone or fabric collection system. This cleaning operation may be done separately, using ambient air, or in conjuction with drying, heat treating, or cooling processes.

Materials of a construction are mild steel, stainless steel, or aluminum as required. (Food Engineering International. 4(6); 1979; 54)

274 Stainless steel strainer

Tank strainer with a 60 mesh replaceable sieve has a 13 inch diameter and is fastened with stainless steel screws to a 3 inch deep body. Strainer comes with arms welded to the body for resting on top of tanks having diameters from 14 to 33 inches. Extension arms are available on request. Sieves can also be furnished with 20, 40, 80 or 100 mesh. (Food Engineering International. 3(9); 1978; 90)

275 Flash cooling plant

The system is suitable for cooling any food product in the form of a puree or juice. It has been used widely to cool tomato paste to be stocked into tanks at a minimum temperature of +2° C. It is available in both a single and double stage plant.

In the one-stage plant the product is cooled in one chamber only in which the vacuum corresponds to the desired temperature.

In the double stage unit, the product is cooled in two separate chambers operating at different vacuum, with settings to obtain the advantages of lower water and steam consumption in comparison with the greater simplicity of the one-stage system.

Plants are built with following standard capacities: 2500 kg/h, 3500 kg/h, and 6000 kg/h. (Food Engineering International. 4(6); 1979; 74)

276 Carbon dioxide tumble freezer

A new tumble food freezer has been developed by Airco Industrial Gases. The new unit is an improved version of a patented model. Freezing with carbon dioxide snow, the unit has application in the individually quick frozen food market. The production and snowing rates are adjustable.

The stainless steel rotating drum has no cavities or pockets and is therefore easily accesible for maintenance. Freezing rate of the unit is up to 25000 pounds per hour.

The freezer is available in three sizes: 15, 20 or 25 feet. (Processed Prepared Food. 148(2); 1979; 64)

277 Ultra-low temperature freezing with nitrogen

High efficiency and ultra-low freezing temperatures are major features of the Cryotransfer XB 402 liquid nitrogen flash freezing system. The liquid carbonic system is of a modular design, making production expansion simple. Standard five foot modules are available for that purpose. Nitrogen spray is controlled by an electronic heat load sensor and a patented counterflow heat exchange process recirculates the nitrogen gas at optimum velocities.

Capacity of the system ranges around 500 points of product per hour, although, larger sizes are available. Freezing at a temperature of 320° F, the Cryotransfer system is fast and eliminates dehydration and formation of ice crystals in the product. The fast freezing also helps in retention of flavor and nutrients of natural juices. (Processed Prepared Food. 148(4); 1979; 52)

278 Plate freezers for packaged food products

Two double contact plate type freezers - The self contained models of the freze-cel freezers, require only condensor water, drain and electrical connection for operation. The smaller model, Freze-Cel 2735, has a freezing capacity of up to 340 pounds per hour. This model is suitable for pilot plants, laboratories and for processing specialty items. The larger unit, 5549, freezes up to 840 pounds per hour. Both units operate with hydraulic raised and lowered Thermo-Film plates constructed of white sanitary molded plastic.

The second model of Freze-Cel plate freezer is a remote unit using ammonia as the refrigerant, although brine circulation may be used. This unit, model 57725, has a freezing capacity from 945 pounds per hour for shrimp to 1950 pounds per hour for beef. Capacity varies according to what product (size) is to be frozen.

The remote freezer models can be equipped with up to 24 stations (25 plates). Optional equipment available includes a hydraulic power unit assembly consisting of a motor pump and tank and a surge tank and drum assembly. (Processed Prepared Food. 148(4); 1979; 50)

279 Automatic cold storage doors

W.H.O. Gorman Manufacturing Ltd., have introduced a fail safe new automatic cold storage door system. Two safety features are incorporated. Firstly, it includes a manual control lever, which in event of power failure prevents the door from closing further, if it touches anything in its path.

The doors are either made of high density polystrene bead board or SP grade styrofoam sandwiched inside. They have manual control for partial opening coupled with automatic closing to reduce refrigeration loss when there is heavy pedestrain traffic. The system is available as a complete track & door operation-biparting or single slide, and can be supplied with automatic track only or as a manual system only with the option of automatic equipment being added. Vertical lift doors are also available. (Climate Control. 2(4); 1978; 8)

280 Microwave vacuum drying

After years of trials this new technology has found its first industrial application in a French plant for dehydrating organge concentrate. Main advantages are high heating rates combined with low process temperatures, thus leading to improved product quality. (Food Engineering International. 4(1); 1979; 31)

281 Invisible heat in Hungary

An Electric Company in Hungary has developed a heat-storing electric cable that is controlled automatically. The essential feature of the cable-heating system is that it can be buried in a building's concrete walls or floors and controlled by thermostat. Electricity is fed into the cable at night, warming the concrete, which then gives off heat during the day. This heating system is claimed to be clean, fireproof, non-polluting and costs only 67% as much as oil heating. (Food Engineering International. 4(1); 1979; 16)

282 Heat recovery system

By using two Kathabar Twin-Cel temperature and humidity heat recovery systems, the Hennepin Country Food Facility in Minneapolis, USA, realized dramatic economic and energy savings. The most significant saving that the system provides is an annual savings in operating costs of $ 27,000.

Additional economic savings are gained in the equipment costs. For instance, the first-cost of refrigeration equipment was reduced by $ 61,860. Another $ 5,100 was saved in heating equipment costs, because the new system allows the company to use a lower BTU unit for its heating operations.

In addition to the economic and energy benefits derived from the system, the Twin-Cel units removed 95% of the air-borne micro-organisms from supply and exhaust air stream, while accurately controlling air temperature and humidity during the winter cycle.

Tests with the Twin-Cel systems show a bacteria removal efficiency of 95 per cent from both airstreams, based on an average atmospheric bacteria distribution and measured by the Six Plate Anderson sampling technique. Dust removal tests show a dust removal efficiency of 35 percent as measured by the National Bureau of standards Dust Spot Test Method on normal atmospheric dust. (Food Engineering International. 4(1); 1979; 55)

283 Turboextractor reduces waste by 50%

Specifically designed for extracting tomato juice and for refining fruit and vegetable purees, model TE-turboextractor features increased yield and improved end-product quality. In addition, compared with conventional pulper-finishers, waste can be reduced by 50%.

Two models are available with processing capacities of 15 and 30 t/h, respectively, and drive powers of 29.5 and 44 KW. Each unit consists of pulper and a finisher mounted on a common frame. To obtain the appropriate screening degree of the product the clearance between radial beaters and screen surface is regulated by axial adjustment of the rotor. This is carried out by controls on the panel during operation of the equipment.

All parts in contact with the product are made of stainless steel and cleaning is effected by a closed loop CIP system. (Food Engineering International. 4(5); 1979; 88)

284 Cooker-extruder is twin screw design

Pembertons Food Processing Equipment Inc. has developed the C.L. (twin screw-induction heated) unit that cooks using the natural moisture content of the food. After cooking the product is at a moisture level of about five percent, eliminating the need for further drying in most cases.

The twin screws (for positive flow) and variable speed drive allow the independence of two variables: feed rate and pressure. The unit can be adjusted for high output with low screw speed and low output with high screw speed. Pembertons guarantees the life of the machine's screws for 6,000 hours. With most products, however, the firms states that the screw life should exceed 10,000 hours. (Processed Prepared Food. 148(2); 1979; 66)

285 Continuous extruder makes dough automatically

Just feed flour and water into this unit and it will automatically mix and continuously extrude dough that has a pre-determined moisture level and temperature. It is USDA approved for use in federally inspected meat and poultry plants. The unit can also handle other types of extrusive materials for the food industry, producing between 500 and 3000 lb/hr, depending on the material and type of extrusion. Drive parts are separated from the extruder assembly for easy house-down cleaning. (Food Engineering International. 4(5); 1979; 75)

286 Acid-proof food pumps

A complete range of impeller pumps designed primarily for the food industry are made of acid-resistant stainless steel. The Series F pumps are self-priming and can be used to pump in both directions. They were designed for pumping liquid and viscous foods such as juice, cordial, puree, jam, etc.

Since Series F pumps have only one moving parts, they treat pumped liquid very gently. Design makes them easy to clean and simple to dismantle. The pumps work at 75-2000 rpm and have a capacity of up to 360 litres per minute. They are available in three sizes, either flanged or for mounting on a base plate. (Food Engineering International. 3(3); 1978; 63)

287 Tough products handled with food pump

A liquid food pump to handle food products has been developed. The positive displacement pump was designed for use with products such as tomato paste, catsup, citrus juice, squash and spinach. A choice of disc, poppet or ball valve designs are available with the pump, featuring a stainless steel cylinder.

Three models are available with capacities of 4 to 18; 15 to 55; and 30 to 120 gallons per minute. (Processed Prepared Food. 148(4); 1979; 61)

PACKAGING

288 Bag-in-box Ketchup

Ketchup in a box, contained in a 3-ply, presterilized poly bag provides volume users of ketchup with product, but eliminates many of the waste and disposal problems associated with large numbers of No.10 tins. Each 3-gallon bag-in-box contains the equivalent of four of the institutional sized cans.

The poly bag is presterilized by irradiation, then "married" to the outer corregated container. The bag is filled under aseptic conditions, in a nitrogen atmosphere to prevent oxygen interchange. The Ketchup, prepared from California paste, is pasturized, then immediately cooled in a heat exchanger. Filling temperatures are near ambient. The use of cool filling temperature not only eliminates

the need for post-filling cooling, but also protects the delicate flavours and aromas of good ketchup. Bag-in-box units are then taped. Taping was a preferred way of closing the boxes because a glued seal invites operators to use knives to open, resulting in slit bags.

The 3-gallon bag weighs approximately 28 pounds. When the box is opened, the bag is rolled away from the box, then shifted into the plastic wall unit. A special, reusable spigot is inserted into the pour spout, and the valve can be opened to dispense as much ketchup as required.

Advantages claimed are, ease of disposing of containers, storage convenience, and operator convenience. Because each bag replaces four open No.10 tins, the amount of product loss is minimized (the bag is easily evacuated). It has been found that about six ounces of Ketchup is usually thrown away in four tins, while only 1½ ounces is generally lost in the bag.

The bag-in-box requires 22 percent less storage space than equivalent tin storage space (three Vol-Paks equal 1.62 cubic feet of storage space, while two cases of No.10's occupy 2.08 cubic feet). Packaging weight is less than half that of No.10's. Price to the operator is about the same per ounce. (Food Product Development. 12(6); 1978; 70)

289 Form/fill/seal machine

Versatile form/fill/seal machine can handle a wide range of products including powders, liquids and solids, in weights up to 50 pounds and at speeds up to 25 packages per minute. This unit forms bags from a variety of commercially available film including unsupported polyethylene tubing and laminated film. This allows the user to utilize the lowest cost packaging material which can properly handle his product. The machine is designed for use with a choice of filling equipment. It has a completely enclosed film feed section which can be pressurized for use in dusty atmospheres or wet environments. Standard unit features include a heat sealing head and discharge chute. (Food Engineering International. 4(2); 1979; 56)

290 Pallet bag system

Many California shippers of fresh strawberries are now using a controlled/modified atmosphere technique for palletloads of product. In fact, during the 1978 season more than ten million trays of strawberries were shipped this way. Use of the pallet bag system begins with stacking between 60 and 96 strawberry trays on a non-permeable pallet, and then placing the pallet in a refrigerated precooling room. A plastic bag is placed over the berries and tape-sealed to the pallet. The special atmosphere is piped in from tanks containing the gas in liquid form, located directly outside the plant. The liquids vaporize before they enter the plant, and are metered through an injection station into each pallet bag. A wall-mounted dial at the injection station is set to shut off the flow of gases when the proper quantity is in the pallet, and reset itself for the next application.

The atmosphere application requires less than 20 seconds and, since it is automatic, frees the cooling plant workers for other activities while the pallet bags are being filled.

Some of the other commodities that adapt most readily to the pallet bag system are lettuce, cherries, peaches, nectarines, bell peppers, grapes and tomatoes. In seagoing containers, a variety of products including fruits, vegetables, meat and fish are being shipped regularly. (Food Engineering International. 4(6); 1979; 74)

l Collating and wrapping machine

This collating and wrapping machine, designated IT 600 CW by the supplier is specially designed for handling products such as bottles, jars or cans with polyethylene or printed film wraps. The unit can handle wraps with or without logo registration. Capacity is up to 50 packs/min.

Products are electronically counted in the infeed lanes and pushed through the film curtain by means of a top flightbar system.

Depending on the dimensions of the configuration either an IT 600 CW unit can be used or the companion model IT 900 CW. (Food Engineering International. 4(6); 1979; 52)

292 Tube packaging for foods

The container is applicable to a variety of food products including syrups, jams, and jellies, and other liquids depending on economic factors and viscosity. The tube and head area are formed as one unit of either low or high density polyethylene materials. Tubes are offered in a wide range of colors and with a variety of outside barrier epoxy coatings. The nozzle spout is offered in a choice of orifice sizes, while the tube is offered in capacities from two to six fluid ounces. (Food Product development. 12(6); 1978; 63)

293 Milk in tetrapacks

Milk in tetrapacks will be marketed in metropolitan cities and big towns in the next two years. The Indian Dairy Corporation has already ordered equipment worth Rs.2.5 crores for the plant to produce laminated paper for these packs. The plant with a daily capacity to produce paper to pack upto eight lakh liters of milk will be located at Itola near Baroda in Gujarat. The second phase covering the entire country will benefit ten million farm families and give better service to 150 million urban consumers. The shelf life of milk in the hygienic tetrapacks could extend to six months at room temperature. Milk would not be more expensive also. (Indian Dairyman. 31(7); 1979; 499)

294 Breathing bag keeps coffee fresh

Fresco, a flexible bag for freshly roasted coffee, is less expensive than the conventional can, the new package with its unique degassing valve retains flavor, freshness and aroma of coffee in excess of six months. (Food Engineering International. 3(9); 1978; 36)

ANALYSIS

295 Foodstuff analyzer

Employing near infrared reflectance, this self-contained, automated instrument provides rapid, precise measurements of a wide range of products and constituents. A built-in expandable computer memory permits up to 50 different product-constituent combinations to be analyzed. For example, the protein, oil, moisture, fibre and carbohydrate content of 10 different products can be measured. Automatic matrix recognition automatically recognizes the product being sampled.

Called InfraAlyzer-400, the instrument covers a large variety of applications including bakery and confectionery products, dairy items, beverages, cereals, grains and feeds, meats, fruits, vegetables, nuts and oilseeds. (Food Engineering International. 4(5); 1979; 68)

296 Direct nitrogen determinator

A rapid, direct-reading nitrogen determinator has been designed to determine the amount of protein in cereals, grains and animal foods. Named the NP-28, the new system takes only 7 minutes for a single determination, making the unit ideal for high-volume control where fast analysis is required periodically.

A major advantage of the NP-28 is the elimination of fumes and hazards associated with the wet, sulfuric digestion method. The Leco NP-28 combusts a 0.5-1.0 gram sample in oxygen and converts the organic nitrogen compounds to gaseous nitrogen and nitrogen oxides. The various oxides are reduced to elemental nitrogen and the total nitrogen then measured by thermal conductivity. Results are amplified, integrated and displayed directly as percent protein or percent nitrogen on an electronic digital volt meter. (Food Engineering International. 3(3); 1978; 54)

297 Quick test for frying oils

Northern Instruments Corporation offers a new instrument that detects, measures and reports the amount of degradation of deep-fat frying oils. Useful for either animal or vegetable based oils, the Foodoil-Sensor is easy to operate, accurate and fast. In just a few seconds, usually, objective data is available that would otherwise take involved laboratory analysis to obtain.

Independent tests have shown the unit capable of keeping track of the build-up of free fatty acids and the drop in iodine value of vegetable oil used to fry potatoes. (Processed Prepared Food. 148(4); 1979; 104)

298 Milk products analyzer

Fat, protein, lactose, and solids of a dairy product can be measured in 20 seconds by the Multispec M from Analytic Equipment. Any one component is measured in only 10 seconds. Relying on infrared spectrometry, use of the instrument avoids the need for messy or dangerous reagents. The analyzer's digital readouts, simple calibration, and ease of use minimize technician's errors. It can be operated manually or automatically. For samples at temperatures of 35 to 45°C, standard deviation of milkfat, protein, or lactose determination is less than 0.06 percent. (Food Product Development. 13(2); 1979; 67)

299 Instrument to determine coffee strength

The portable test instrument for the determination of coffee strength provides the ability to control coffee flavor to the consumer. It is expected that the meter will find wide usage by food service operators, coffee distributors, and equipment manufacturers. The battery powered instrument operates on the principle that the electrical conductivity of the liquid is proportional to the dissolved coffee content. Thus, both the percent soluble solids (up to 1.50%) in the coffee

beverage and the total dissolved solids (up to 1000 parts per million) of the preparation water may be determined. A zero-out adjustment allows the conductivity of the preparation water to be subtracted from the total conductivity of the coffee beverage, leaving a true reading. (Food Engineering International. 4(1); 1979; 67)

300 Photometers to measure microorganisms

Utilizing light-producing chemical reactions, instruments from SAI Technology Co. quickly detect as few as 1,000 bacteria in a variety of quality assurance, process control, and research applications. The reaction of luciferin with luciferase in the presence of microbial adenosine triphosphate (ATP) is employed in an ASTM-approved method for quantifying yeast concentrations at a large western brewery. The method can be used similarly to check on bread processing, detect contamination of wine, or monitor water recycling. In cases where non-microbial ATP causes difficulty, incubating the sample after initial assay and making a second determination gives a differential estimate of microbial levels. An alternative to the ATP method is measurement of chemiluminescence caused by microbial porphyrins, which occur at a more nearly constant concentration than ATP in microbial cells. (Food Product Development. 12(10); 1978; 36)

301 Systems automate microbial assays

Bactometer™ systems grow and measure contaminating microbes much faster than conventional microbiological methods, e.g., 100,000 bacteria per gram of green beans can be quantified in five hours. Based on measurement of electrical impedance, the Bactometer method does not require optical clarity and can employ a variety of media, including selective ones. Sample preparation is minimal, usually requiring no dilution after initial suspension, and sample sizes from milliliters to gallons are accommodated.

The Bactometer 32 simultaneously monitors 32 samples in an incubator with temperature range of 30 to 45°C and control sensitivity

of ±0.2°C. Ratio of impedance in inoculated medium to impedance in uninoculated control is shown on a LED display with accuracy. ±0.01% of full scale. Readout options include a strip chart recorder and a computer interface.

Models appropriate for low and high testing loads are Bactometer 8 and Bactometer M-120. Bactometer 8 measures impedance in 8 cultures at a time with accuracy of ±0.1%. It does not provide temperature control. Model M-120 is a computerized system preprogrammed to detect microbial responses and composed of incubators for up to 480 samples, dedicated microprocessor, and printer for entering or presenting data. It can produce finished quality control reports. (Food Product Development. 12(10); 1978; 36)

302 Test strips provide accurate bacteria detection.

An economical, new and simplified system provides accurate detection of bacterial contamination of non-porous surfaces and liquids. This test strip system is useful in both field tests as well as part of a routine food plant sanitation control program. The system is convenient to use. There is no pre or post-laboratory preparation of equipment or refrigeration required. In addition, it takes only 20 minutes of instruction for a person to become sufficiently proficient to perform accurate testing. With the sanitation test strips, sampling and interpretation of results takes less than two minutes and incubation time is no longer than with any other culture procedure for bacterial growth. (Food Engineering International. 4(1); 1979; 61)

303 Kit to estimate chlorine levels

A color comparator test kit facilitates quick, easy tests of sanitizer solutions. The test kit employs the DPD reagent system to develop color immediately in the presence of chlorine. A test tube containing the reacted sample is placed in the comparator. Where a light filter screens out background colors to permit accurate matching. Permanent color standards represent chlorine concentrations of

10, 20, 30, 40, 50, 75, 100, and 200 ppm. (Food Product Development. 12(10); 1978; 36)

304 Analyzer for toxic elements

In as little as 4½ minutes, the EXAM 6 System can analyze a prepared sample of an ingredient for seven toxic metals plus 30 to 40 other elements. Sample preparation requires only grinding (if the ingredient is not powdered or finely granular), drying to 5-9% moisture, and pressing into pellets to fit the sample holder. Thus, a shipment of raw material can be tested for acceptability fast enough to permit normal unloading or rejection before unloading.

The instrument's capabilities include quantitative analysis for mercury, arsenic, selenium, lead, molybdenum, cadmium, and antimony down to threshold levels of 5 to 40 ppm and qualitative analysis for the other elements. The sample can be stored for further analysis. EXAM 6 automatically types out analytical results and records them with other relevant information on magnitic disks. After sample preparation, analysis is a push-button procedure. When an automatic sample loader is added, the instrument can run up to 60 determinations unattended. (Food Product Development. 13(2); 1979; 67)

ECONOMIC & COMMERCIAL STATISTICS

305 Augmenting Shrimp Production

The Marine Products Export Development Authority (MPEDA) has made appreciable beginning in the scientific shrimp farming through a a record harvestfrom a 0.22 hectare brackishwater pond near Cochin. In a single crop of three months duration 112.5 Kilogram shrimps were obtained from this area. Stocking of shrimp fry (penaues indicus, P.monodon in the ratio 4:1) was done at the rate of 50,000 per hectare

and survival at the end of culture period was 60.34 percent. Experiments conducted elsewhere have proved that nearly 1,000 kilogram shrimps worth Rs.30,000 can be produced from one hectare brakishwater pond in two short term crops.

There are nearly 2 million hectare of cultivable brackishwater area in India where shrimps and other fish can be cultivated. Even if only 0.5 percent of the available area is brought under cultivation about 10,003 tonnes of shrimps can be produced. This will amount to an increased production of one fifth of the total quantity of shrimps exported from India during the year 1978. Brackishwater shrimp farming is expected to improve the economic set up of the backward rural areas along India's coast line by providing productive employment for the fishermen and farmers. (Economic and Commercial News. 9(24); 1979; 9-10)

306 Oil palm cultivation

Oil Palm India Ltd. a subsidary of the State-owned Plantation Corporation of Kerala, will bring another 4,000 hectares under oil palm cultivation in Kerala. The project, costing Rs.8.5 crores, is expected to be completed in the next five years.

An area of 1,150 hectares had already been brought under cultivation at Anchal in Quilon district as part of a phased programme. The remaining area would be covered by 1980 for which the necessary seedlings had already been germinated from 1.5 lakh high yielding "Tenera" variety seeds imported from Papua each seed costing Rs.4.50. The first stage project would alone cost Rs.4.98 crores. An annual yield of 15,000 tonnes of palm oil is expected when the entire plantation of 6,000 hectares attains maturity, according to a spokesman of the project. (The Oils and Oilseeds Journal. 31(3); 1979; 9)

307 Estimated production of gur (including khandsari)

thousand tonnes

States	1977-78
Andhra pradesh	837
Assam	120
Bihar	114
Haryana	605
Karnataka	430
Maharashtra	207
Madhya pradesh	134
Punjab	460
Tamilnadu	1131
Uttar pradesh	4906
Other States	553
All India	9497

(The Economic Scene. 4(3); 1979; 161)

308 Estimated of production of Coconut in India

(Quantity in million nuts)

States	1977-78
Andhra pradesh	164.6
Assam	31.0
Karnataka	815.5
Kerala	3366.5
Maharashtra	49.9
Orissa	58.9
Tamilnadu	1035.5
Tripura	1.1
West Bengal	22.0

Contd.....

Andaman & Nicobar Islands	65.7
Goa, Daman and Diu	86.0
Lakshdweep	21.8
Pondicherry	15.1
All India	5733.6

(The Oils and Oilseeds Journal. 31(3); 1979; 34)

309 Marketing of Walnuts

	Price		
	1975	1976	1977
1. Production ('000/M.T.) (in-shell basis)	15.5	15.0	12.0
2. Walnut (in-shell)	3.14-7.00	4.0-6.00	5.0-5.15
3. Walnut Kernels:			
(i) Light halves	7.25-10.00	12.0-13.00	15.0-16.00
(ii) Light brokens	5.00-7.00	10.0	12.0-13.00

(Profodcil Bulletin. 13(3); 1978; 11)

Basic indicators of different countries

Country	Population (millions) Mid-1977	Areas(thousand square Kilo-metres)	GNP Percapita (US dollars) 1977	Average annual growth (Percent) 1966-77	Adult Literacy Rate (Percent) 1975	Life Expectancy at Birth 1977	Index of per Capita Food Production 1969-71=100 Av. 1975-77	Per Capita Energy Consumption (Kilograms of coal equivalent) 1960	1976
LOW INCOME COUNTRIES (W)			170	1.4	35	50	98	113	166
3. Bangladesh	81.2	144	90	0.4	22	47	96	-	33
7. Nepal	13.3	141	110	0.2	19	45	95	5	11
14. Burma	31.5	677	140	0.9	67	52	95	55	49
16. India	631.7	3,288	150	1.3	36	51	99	142	218
19. Vietnam	50.6	330	160	-	87	62	100	-	124
20. Afghanisthan	14.3	647	190	0.2	12	42	102	15	41
21. Pakistan	74.9	804	190	3.0	21	51	101	61	181
25. Sri Lanka	14.1	66	200	2.0	..	69	113	107	106
31. Kenya	14.6	583	270	2.5	40	53	89	143	152
36. Indonesia	133.5	2,027	300	3.3	62	48	104	129	218
MIDDLE INCOME COUNTRIES (W)			1,140	3.6	69	60	105	393	916
38. Egypt	37.8	1,001	320	2.1	44	54	97	298	473
45. Thailand	43.8	514	420	4.5	82	61	110	64	308
62. Korea, Rep.	36.0	99	820	7.4	91	63	113	258	1,020
75. Taiwan	16.8	36	1,170	6.2	82	72	-	583	1,797
79. Brazil	116.1	8,512	1,360	4.9	76	62	118	332	731
85. Iran	34.8	1,648	2,160	7.9	50	52	109	270	1,490
87. Hong Kong	4.5	1	2,590	6.5	90	72	60	468	1,313
90. Israel	3.6	21	2,850	4.8	88	72	114	1,270	2,541
91. Singapore	2.3	1	2,880	7.5	75	70	101	372	2,262

Contd.....

INDUSTRIAL COUNTRIES (W)			6,980	3.4	99	74	106	4,462	7,079
96. United Kingdom	55.9	244	4,420	2.5	99	73	107	4,861	5,268
97. Japan	113.2	372	5,670	7.7	99	76	99	1,171	3,679
105. Germany Fed. Rep.	61.4	249	8,160	3.3	99	72	99	3,695	5,922
107. United States	220.0	9,363	8,520	2.4	99	73	112	8,172	11,554
CAPITAL SURPLUS OIL EXPORTERS									
111. Saudi Arabia	7.6	2,150	6,040	6.7	..	48	92	267	1,901
CENTRALLY PLANNED ECONOMIES (W)			1,160	3.4	..	66	110	1,378	2,067
114. China, People's Rep.	885.6	9,597	390	5.1	..	64	110	683	706
116. Korea, Dem.Rep.	16.7	121	670	5.1	..	63	124	989	3,072
122. USSR	258.9	22,402	3,020	3.7	99	70	106	2,839	5,259
129. German Dem.Rep.	16.9	108	4,680	3.2	..	73	122	4,950	6,789

(Financial Express. 28-8-1979)

311 Support price operation losses to be made good

The Government has decided that wherever support prices for commodities are announced by the Centre, not only financial arrangement will be made, but also the losses involved in such operations will be made good.

The Centre will make available the funds to the state government or to the marketing bodies for purchasing commodities. In cases were the marketing operation will be conducted in co-operation with NAFED the funds will be made available to marketing federations by NAFED.

But wherever losses in support operations will be involved, the Government will take the responsibility of meeting these losses. This decision is expected to strengthen the State Marketing Federations and encourage them to go into the market in full swing. This is to ensure a remunerative price to the growers and help to step up production. (The Oils and Oilseeds Journal. 31(3); 1979; 8)

312 Edible rice bran oil to be produced

Edible rice bran oil may be produced in India within a year with Japanese knowhow. Three engineers had been sent to Japan to learn the technology and were expected to return in six months. Adoption of this technology will enable India to produce five lakh tonnes of edible rice bran oil from 50 million tonnes of rice produced in the country.

At present about 70,000 tonnes of industrial quality rice bran oil is being produced annually in India and used for soap-making. Initially half a million tonnes of edible rice bran oil will be produced. The necessary legislation will be initiated to modernise the rice milling industry. (The Oils and Oilseeds Journal. 31(3); 1979; 10)

313 Agro based industry for Small Scale Sector

Sixteen important processed food manufacturing activities which include ice cream, dehydrated vegetables, pickles and chutneys, vinegar, rice milling, dal milling, bread, biscuits, confectionery, rapeseed oil, mustard, sesamum oil (except solvent extracted), sweetened cashewnut products, poultry feed, ground and processed spices are now reserved for exclusive development in the small sector.

The horticultural crops are assuming substantial economic importance in the industrial and export fields. Raw onions, bananas, mangoes and potatoes have shown considerable export potential. In addition, processed mango juice, mango pulp, pickles, chutneys dehydrated onions, etc. figure prominantly in exports. There is great scope for the processing of pineapples, bananas, tomato products and canned vegetables. Of the total 32 million tonnes output of fruits and vegetables in the country, 22 million tonnes are fruits and 10 million tonnes are vegetables and tubers. It is estimated that at present there are about 1,300 units engages in the manufacture of fruit and vegetable products. Of these, 32 units are in the organised sector with a total production capacity of 978 tonnes per annum and the rest are either small or cottage scale units.

A close scrutiny of the marketing pattern reveals that of a total production of 55,000 tonnes (1977), 15,000 tonnes were exported. The balance of 40,000 tonnes consumed in the home market was purchsed by (i) Army Purchase Organisation (APO) and Canteen Stores Department (CSD), (ii) hotels and restaurants, and (iii) house-hold consumer.

Mango products have already made a good breakthrough in the export markets during the last few years. Recently, India exported 6,000 tonnes of mango juice to USSR, 2,000 tonnes of mango juice, slices, and pulp to Poland, 2,000 tonnes of mango juice to West Asian countries, 500 tonnes of mango pulp to USA and 400 tonnes of Manago pulp to West Germany. Poland has shown interest in the purchase of 15,000 tonnes of tomato paste, apple and cherry concentrates.

pineapple, mango, banana pulps etc. on a long term basis. Czechoslovakia, USSR and East Germany are also interested in purchasing 5,000 to 6,000 tonnes of pineapple products. In view of the expanding export market for canned vegetables, fruit juices, fruit pulps and pickles, there is ample scope for development of fruit and vegetable preservation industry which could make specific contributions to help revitalise rural communities and build better agriculture. (Economic and Commercial News. 9(26); 1979; 13-14)

314 New import classification-USA

Beginning January 1, 1979, import statistics for spice oleoresins will be available in a separate classification. Formerly, these statistics were in a basket classification (TSUSA No.450.2000) together with flavouring extracts, essences, etc. The new import classifications for spice oleoresins, are for paprika oleoresins (TSUSA No. 450.2010) and other oleoresins (TSUSA No. 450.2020). (Spices News Letter. 13(6); 1979; 2)

315 Imports of palm oil into India

Imports of palm oil during 1976-77 and 1977-78 into India were of the order of 39,971 and 4,60,075 tonnes respectively. (The Oils and Oilseeds Journal. 31(3); 1979; 29)

316 Import of rapeseed oil

During 1978, State Trading Corporation imported 66,000 tonnes of rapeseed oil valued at Rs.37.72 crores Private trade during this period imported about Rs.1.89 lakh tonnes valued at Rs.10,609 crores through Bombay and Kandla Ports. (The Oils and Oilseeds Journal. 31(3); 1979; 29)

317 Ban on import of coconut products

The Indian Coconut Development Council recently recommended

immediate ban on import of coconut oil, copra and all coconut products to ensure a fair, steady and remunerative price to the growers.

At the 12th meeting of the Council at Cochin, growers' representatives from various States expressed anxiety over the import of copra and coconut oil and pointed out that this had resulted in a decline in the internal market price. (The Oils and Oilseeds Journal. 31(3); 1979; 9)

318 Importers of Walnuts

United Kingdom

R. Atcherley & Co., Ltd.,
Bridge Estate, Speke Hall Road,
Liverpool L 24 9-NA.

W.J. Roberts & Co.(Produce)Ltd.,
35, Borough High Street,
London SE 1 1 IZ.

C.G. Hacking & Sons Ltd.,
Adelaide House, London Bridge,
London EC 49 DR.

T.M. Duche & Sons (U.K.) Ltd.,
Ford Lane, Pendleton,
Salford MA 6 PB.

Gill & Duffus Ltd.,
23 St. Dunstans Hill,
London EC 3 R 8 HR.

Richard Hochfield Ltd.,
London Fruit Exchange,
Spitalfields,
London E 1.

G.C. Williams & Co., Ltd.,
24-25. Mark Lane,
London EC 3R 7 DQ.

Barrow, Lane & Ballard' Ltd.,
10/12, Creechurch Lane,
London EC 3A 5 AD.

J. H. Rayner & Co., Ltd.,
Baltic Exchange Chambers,
28, St. Mary Axe,
London EC 3A 8EP.

Eastern Impex (London) Ltd.,
2, Middlesex Street,
London E1.

Beddington Nut & Produce Co. Ltd.,
Highlands Hill,
Swanley Kent.

Federal Republic of Germany

Roland Stoltzenberg,
Grossmarktstand 407,
2000 Hamburg 1.

Heinrich Pasemann,
Fruchthof,
2000 Hamburg 1.

E.P. Springer & Co.,
Stelndamn 52,
2000 Hamburg 1.

Australia

Walters Trading Co. Pty Ltd.,
G.P.O. Box No.507, Melbourne,
Victoria.

Lee Mckeand & Sons Pty. Ltd.,
457-465, Malvern Road,
South Yarra 3141,
Victoria.

Yugoslavia

Cobex, Kneza Milosa 9-11/v,
Belgrade.

Centroprom, Export-Import,
Nusiceva 15, P.O. Box No.454,
Belgrade-11001.

Centrocoop Export Import,
Generala Zdanova 15,
Postfach 258,
Belgrade-11000.

Cooperative,
Obilicev Vanac 5,
Belgrade-11000.

Stokorromet,
Kej 13, November Kula 3,
P.O. Box No.158,
Skopje.

USSR

V/o Sojuzplodoimport,
32/34, Smolenskaya-Sennaja Pl,
Moscow-121 200.

Czechoslovakia

Koospol Export-Import,
Leninova Str 178,
Praha-6.

German Democratic Rebublic

Fruchtimex Aussenhandlesgesells-
chaft mBH, Schiklerstrasse 7,
102, Berlin.

Poland

Agross,
Ul Zurawia 32/34,
P.O.B.41, 00950 Warsawa.

(Profodcil Bulletin. 13(3); 1978; 43)

319 Exports of spices from India during 1978-79

(Quantity: M. Tons; Value:- '000 Rs.)

Commodities	Quantity	Value
Black Pepper	15145.21	275640.60
White Pepper	58.04	1913.53
Dehy, Green Pepper	36.77	2443.78
Pepper Powder	27.81	719.45
Total Pepper	15267.83	280717.36
Cardamom small	2902.55	595558.66
Cardamom big	74.32	2040.89
Chillies	26806.19	259881.05
Chillies Powder	3404.36	32397.09
Total Chillies	30210.55	292278.14
Ginger	11784.07	128138.81
Ginger Powder	11.48	222.62
Total Ginger	11795.55	128361.43
Turmeric	7927.56	83849.94
Turmeric Powder	2350.49	26483.85
Total Turmeric	10278.05	110333.79
Curry Powder	2061.54	22446.64
Coriander seed	10660.00	41457.46
Coriander Powder	595.32	3113.67
Total Coriander	11255.32	44571.13
Cumin seed	1786.96	27554.33
Cumin Powder	28.99	558.22
Total cumin	1815.95	28112.55
Clery seed	3129.62	19894.31
Celery powder	2.00	15.98
Total Celery	3131.62	19910.29
Fennel seed	999.20	7675.41
Fennel Powder	0.24	2.28
Total Fennel	999.44	7677.69
Fenugreek seed	3368.07	10474.80
Fenugreek powder	12.10	68.92
Total Fenugreek	3380.17	10543.72
Garlic	3583.43	16686.02
Garlic flakes	567.51	9321.67
Garlic powder	66.40	1065.54
Total Garlic	4217.34	27073.23
Cassia	328.97	1926.82
Cassia Powder	5.50	29.33
Total Cassia	334.47	1956.15
Nutmeg	-	-
Nutmeg Powder	0.02	2.12
Total Nutmeg	0.02	2.12
Mace	0.52	5.36
Mace Powder	0.02	1.95
Total Mace	0.54	7.31
Tejpat	158.79	237.23

Contd.....

Misc. Spices	1268.01	9967.21
Oils of Spices	17.48	10440.00
Oleoresins of Spices	122.77	16812.88
Total	99292.31	1609048.42

(Spices News Letter. 13(5); 1979; 2)

320 Export of molasses

The Government has revised the policy of exporting molasses by amending the export (order) 1977 thereby bringing the export of molasses under OGL 3. This is likely to benefit sugar factories as a larger quantity of molasses may be exported. (N.S.I. News. 14(4); 1979; 6)

321 Export potential for Indian spices

A three-member team recently concluded a market survey for spices and cardamom in West Asian and North African Countries (WANA), namely, Iraq, Syria, Jordan, Egypt, Tunisia, Libya, Algeria and Morocco.

At present India's exports to these markets constitute only about 3 percent in relation to the total exports of spices from India. It was, however, observed during the survey that these countries import fairly large quantities of pepper, turmeric, cassia and spice seeds from many sources chiefly from Singapore China, Brazil and Malaysia. India's share in these markets is very limited except in the case of Iraq where India supplies about 50 percent of the imports. According to the findings of the team, there is good scope for developing export of pepper, cassia, turmeric, ginger and certain spice seeds to these markets.

The size of the market for pepper in these countries is quite big about 7,000 tonnes but India's share is limited to about 200 tonnes, mostly to Egypt. The bulk of the supplies come from Singapore, Malaysia and Brazil, In fact, Singapore is the major supplier in this region.

Turmeric is the next important spice of interest to India in these markets amounting to about 1,770 tonnes. India holds a major share in commodity, although China has made some inroads in certain markets like Egypt.

The market for cassia is quite substantial in these markets amounting to 1,540 tonnes. China holds a monopoly in the markets (more than 95 percent). India is supplying some small quantities to certain markets like Jordan, Tunisia and Algiers.

Spice seeds are the next important item. Since most of these countries produce one or the other spice seeds like coriander, cumin, fennel, etc. imports fluctuate according to local production and demand.

The market for ginger in these countries is rather small. India is the major supplier, although recently China, Sierra Leone and Bangladesh have come into this market.

The prospects of exporting chillies to these markets are limited, since Egypt, Tunisia, Algiers and Morocco are known to be producers of red chillies and Syria produces green chillies. However, small quantities could be exported for purposes of re-export.

Except for Iraq, the market for curry powder in other countries is negligible. There is scope for consolidating and increasing the export of curry powder to Iraq.

The size of the market for packaged spices is limited. However, Jordan and Libya offer very good scope for exporting spices in consumer packages.

The team has identified specific problems which impede export of spices to the countries and has recommended a number of steps, both generic and specific, to develop exports to this region.

The project was undertaken under the programme of integrated Technical Co-operation between the Government of India and the International Trade Centre, Geneva, Switzerland. (Economic and Commercial news. 9(26); 1979; 4-5)

322 Export of Onions

Year	Qty. (M.T.)	Value in Rs. (Lakhs)	Per Unit Value (Rs.)
1976-77	175822	1960.87	1115
1977-78	56014	872.01	1557

(Profodcil Bulletin. 13(3); 1978; 44)

323 Trade Enquiries

The following Trade Enquiries have been received by the Council from various sources for processed Food items. Interested exporters may get in touch with the undermentioned parties. The Council, however, does not assume any responsibility for their financial standing and business integrity.

Name of the Importer	Items Interested
M.H. Boas B.V. Postbus No.16316, 2500 B H. The Hague.	All items of processed Food
The Oman National Dairy Products Co. Ltd., P.B. No.3610, Ruwi, Sultanate of Oman.	Vanila flavour, Toffee flavour and chocolate flavours
Y.E.S. Trading Co., 3-27-2 Hikarioka, Hakataku, Fukuoka, Japan.	Canned fruit products Canned vegetables Canned Mushrooms and Dehydrated Onion

Kuwait Foods & Beverages, Co., P.O. Box No.22528, Kuwait.	Processed Foods
Emersons Food Ltd., 631-A, High Road, Clford, Essex, IG 3 8RG, United Kingdom	Jaggery
Sofan Trading & Contracting Est., P.O. Box No. 42089, Shuwaikh, Kuwait	All items of Processed Food
Chetan Enterprises, P.O. Box No.2548, Dubai.	Biscuit, Confectionery, Ghee and Canned Vegetables
Panda Trading Est., P.O. Box No. 3311, Riyadh, Saudi Arabia.	All items of Processed Food
Joltway Limited, 11, Ancone Road, Harlesden, London.	Frozen and dried vegetables
Fouad Atwan, Khaled Omeira Building, Basha St., Damascus.	Tamarind

(Profodcil Bulletin. 13(3); 1978; 50)

FOOD LEGISLATION, QUALITY CONTROL AND HYGIENE

324 Ethylene dichloride called carcinogen

Ethylene dichloride (1, 2-dichloroethane) reportedly caused rats and mice to develop cancers in feeding studies conducted for the National Cancer Institute by Hazleton Laboratories. The compound has several food industry uses, including spice extraction and grain fumigation, and it is an intermediate in production of vinyl chloride and vinylidine chloride. If the conclusions of the bioassay report are accepted, FDA can be expected to propose a ban on all food uses of the compound. (Food Product Development. 12(11); 1978; 31)

*Hcs.

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* * * * * * *

STORAGE

325 Underground grain storage

In the dry parts of Northern Australia, grain has been successfully stored in underground pits lined with polythene sheeting. The cost of storage is very low and there is little insect damage because the grain is virtually in an air tight compartment. The pit is dug about 2 metres deep and to a suitable size to hold the amount of grain available. It is lined with 0.05 mm polythene sheeting over the bottom and sides, with sufficient overlaps at the sides to prevent moisture entering. An extra sheet covers the grain when the pit is full. With this in place the pit is covered with 30-40 cm of soil. (Documentation Bulletin. 36; 1979; 34)

326 Chemical free insect control method

The United States Department of Agriculture has developed a trap to control insects in food processing plants. The trap is a simple corrugated cardboard box treated with an insect attractant (Pheromone). Pheromones may be used with other substances, such as small amounts of a chemical pesticide placed in the trap, or sticky substances placed so that mass trappings of pests may take place, or pheromones may be used with biological agents. The method would not result in the immediate kill-off of the pest, however, the infected insect would spread the disease to other insects resulting in the eventual breakdown of the population. (Processed Prepared Food. 148(1); 1979; 95)

327 Rat poison from Thevitia

Thevitia nerifolia is a common garden shrub used as a hedge plant. The seeds of this plant are poisonous. It is a hardy plant growing wild also and the fruits are available all round the year. In Orissa, many farmers in the remote villages use the seeds for effective control of rats. The ripe fruits are sun dried and the extracted kernels are further dried ground into fine powder. About 10 gm of the Thevitia seed powder is mixed with 80 gm of wheat flour. This is rendered tasty with 2 gm of molasses and

flavoured with 2 mgm of vegetable oil. Poison baits of 1 to 1.5 gm weight made from this paste are placed in live holes through which rats enter and get out. The live holes are identified by closing all the holes with mud in the evening. Some of the holes will be open next morning indicating them as the live holes. (Hindu. 26-9-79; 2)

8 Preservation of tapioca tubers

Tapioca tuber is highly perishable and cannot be kept for more than 3 to 4 days. During the peak harvest time there will be great rush to the market resulting in lower selling prices. To overcome this farmers have to store the tuber for at least several weeks.

Since most of the known methods for preserving cassava are either too expensive or use materials which are unavailable. It is common practice in some parts of Kerala to use tapioca leaves to cover fresh roots which the rural women carry in baskets to the city market. With this background preservative effect of several leaves including cassava, mango and jack were investigated by storing the tuber along with the leaves or moist sawdust or sand in 50 litre wood boxes. After four weeks, the interlaying method was found significantly superior to placing in either sawdust or sand. The lowest percentage of deterioration was observed for the roots stored in the cassava leaves. These roots had also smallest decrease in starch content and the lowest reducing sugar content.

The interlayered cassava leaves not only provided an optimum temperature of 35-40°C and a relative humidity of 85-90% but also slowly liberated hydrogen as they dried. It is thought that the presence of HCN reduced the possibility of root Cyanine disease by preventing pathogens from entering the root where it was cut from the plant.

Although the supply of leaves available at harvest time would be sufficient to store only 30-40% of the harvested roots, it should be noted that it is probably not possible to find more than 40% of a crop whose roots have not been injured and are therefore suitable for such storage. (League for International Food Education. July 1979; 3)

329 Thermo-active coating reduces moisture loss

Germantown Manufacturing Company offers Seal-N-Save, a liquid thermo-active coating that is used in foods to reduce moisture loss especially in deep-fat-fried breaded items such as meat, poultry, seafoods and onion rings. According to the manufacturer, Seal-N-Save offers greater profit for the processor due to a lower loss of weight during frying or pre-frying or during freezing. The product improves eating quality of breaded foods due to greater moisture retention, allows less oil penetration into foods and reduces weight loss during storage of frozen foods. (Processed Prepared Food. 148(6); 1979; 88)

330 Ageing of honey

Unlike the refined sugar and some of brown sugars, honey has laxative and disinfectant effect on the digestive tract, kidneys, and gall bladder, thanks to the aromatic substances it contains. The component oligoelements have a favourable effect on tissue metabolism especially in anaemia, nervous affections, mental breakdown - due to iron and phosphorus, in leukemia and precarcinoma (lavender and heather honey is preferable).

Honey is acid (pH 3.8-4.4%) and liquid when extracted. Then, because of the sucrose crystals, it granulates. Heated in water-bath it becomes clear and liquid again, then it granulates when cooled after having been seeded with crystals. These different states do not change its nutritive qualities. In liquid phase, its levulose content is lower than in the solid phase.

Honey is however "ageing" irrespective of how properly it is stored, it should be stored in coloured glass not in metal or wood containers, and at constant, sufficiently low temperatures (below 18°C). When no preservative substance is added and it is stored at temperatures below 18°C, the amount of sucrose in it decreases as it is normal, while the amount of "glucose + levulose" increases accordingly under the effect of invertase. The superiority of adequately stored pure honey, even if relatively "old" is due to the following factors:

- Honey is readily assimilable into blood, no digestion being necessary, an advantage in pancreas deficiency and in some types of diabetes.

- Honey contains oligoelements while the refined sugar does not.

- It contains vegetal components which clears the digestive tract and favours the symbiosis enteric flora.

- Honey is a high-energy food useful in physical efforts, in infections, and during epidemics as it clears the tissues, the intestine, and kidneys, and fortifies the heart.

The physicians who forbid carcinoma patients to consume it are wrong. Provided it is not used in excess and is thoroughly mixed with saliva, it should be included in the diet of people suffering from anaemia, carcinoma, heart nervous and lung affections, from constipation, consumption, etc.

Long storage causes gradual decrease in the variety of enzymes and in the activity of the biocatalizers in honeys. For table consumption and sweetening tea the honey stored for less than 5, and better - for 3 years is recommended; the honey stored for a longer period should be used in jams and baked products because the production process indudes its boiling. (Apiacta. 13(2); 1978; 81-2)

FOOD ADDITIVES

1 Spray-dried buttermilk flavors

These have applications in mixes for baked goods and icings, salad dressings, instant soups and sauces, and snack food seasonings. Spray-dried buttermilk flavors are available in formulations: C-7242 which includes natural and artificial ingredients; and C-7244 which is composed of natural buttermilk flavor with other natural flavors. (Food Technology. 33(5); 1979; 202)

PROCESSES

332 A new approach to water sterilization

A new water purification process using a combined ultaviolet-ozone treatment is described. The small power consumption - some 8 Watts of electric energy to sterilize 200 litres of water - makes possible the use of batteries and thus consequently enable water purification even in remote areas not disposing of electric mains.

Ultraviolet radiation sterilized water provides bacteria and viruses-free food process water without the use of germicides, oxidants, algaecides or chemical precipitants and is particularly applicable where chlorine adversely affects flavour

a) For the brewery, winery, soft drink and water bottling industries, where biologically purity of water must be absolutely maintained in order to insure constant product quality.

b) For safeguarding against spoilage of dairy product. e.g. cottage cheese and butter. Certain psycrophillic bacteria are resistant to chlorine treatment.

c) For fish hatcheries, oyster and shrimps breeding, etc. where pure water is essential.

d) For sterile washwater. To guard against waterborne bacteria spoilage where vegetables, fruits, meats fish and other products must be washed in water before canning or packaging. (Cyprus Industrial Journal. 3(6); 1978; 145-8)

333 Guargum

Defence Research and Development Establishment, Gwalior, has developed a process for manufacture of guar gum, which is available for commercial exploitation. (Industrial Products Finder. 7(10); 1979; 11)

Controlling nitrosamine formation

Control of nitrosamine in bacon is accomplished with a method utilizing a lactic acid starter culture-called Custom Cultures™ blend. The starter culture reduces residual nitrite in bacon to control subsequent formation of nitrosamines during frying; prevents growth of Clostridium botulinum; and produces consistent flavour, colour, and product stability in bacon. (Food Technology. 33(5); 1979; 202)

New decaffeination process

COFFEX has developed a new method to decaffeinate green coffee. Instead of chlorinated solvent Coffex uses water. The new process is called Secoffex. The decaffeinated coffee correspond strictly to legal prescriptions. And coffee experts to whom samples have been submitted said they like the natural flavor of the product. (Tea & Coffee Trade Journal. 151(2); 1979; 33)

Alcohol from milk

A cheese factory in Ireland is producing 3,000 gallons a day of 169 proof alcohol from milk. The alcohol is transformed into gin and vodka. The process is quite complex and offers little hope for the amateur with a few bottles of milk. The alcohol is made from whey left over after cheese making. Equipment operating on the same principle as kidney machines are used to extract the protein and then ferment the lactose to produce alcohol. The resulting alcohol can be used in the manufacture of any spirits which can be made from molasses. The plant expects to produce 1.78 million gallons of alcohol and 11,000 tons of cheese a year from some 24 million gallons of milk. (Food in Canada. 39(1); 1979; 29)

BYPRODUCTS AND WASTE UTILIZATION

337 Cattle feed from sugarcane waste

Sugar cane wastes (such as sugar cane tops, leaves and other refuse of the plant) can be converted into a palletized form of cattle feed. A machine chopper is used to cut cane tops, fresh or dried, into pieces of about an inch long. This is dried from one to ten days in sunlight to about 20% moisture. The chopper machine used can cut two tons of the waste materials per hour. 1.6 hectares of sugar cane can yield ten tons of the palletized feed. This will also solve the wastage disposal problem. (Technonet Asia Newsletter. Supplement. 24; 1979; 2)

338 Fuel developed from farm waste

Scientist have developed a process that converts farm waste into fuel and could save the U.S. billions of dollars a year in oil imports. The Scientists at Indian's Purdue University have refined a process to turn corn stalks, crushed sugarcane leaves, saw dust, peanut shells and other plant waste into alcohol.

The alcohol can then be blended with gasoline to make "Gasohol" to run cars, trucks and farm machinery. (N.S.I. News. 15(1); 1979; 6)

PROCESSED PRODUCTS

339 Ayurvedic baby food

The Regional Research Institute (RRI) of the Central Council for Research in Ayurveda and Siddha here has developed an ayurvedic "baby food" having high nutritional value for undernourished children. Named "Ayurbala", the food is in the form of a biscuit. The food contained ashwagandha, soyabean, calcium and other minerals. Ayurbala was a contribution to the International Year of the Child. (Times of India. 6.10.79; 4)

EQUIPMENT & MACHINERY

Grain cleaning apparatus

Grain cleaning apparatus is available for commercial exploitation. The apparatus would sift sand from wheat or rice using the siphoning principle and centrifugal force. Components incorporated include siphoning tube, water hand pump, collecting container and funnel. No electricity is required for operation. (Industrial Products Finder. 7(11); 1979; 63)

Bone/tissue system improves ground meat

A tissue collecting system designed to help separate and eliminate cartilage, gristle, stray bone chips and other tough connective tissues that might exist in meat trimmings used for ground meat products has been developed. Because the unit can operate continuously, it reduces the frequency of troublesome grinder plate. The machine also minimizes bone build-up behind the grinder plate and plate blockage helping to maintain product definition and grinder production rate. (Processed Prepared Food. 147(12); 1978; 87)

Sorting potatoes by television

Loctronic graders are reported to have found a solution to the laborious and unpleasant task of sorting vegetables for quality and size using a television monitoring systemto replace the traditional 'backache' method. The operator uses a hand-held probe linked to a television monitor to sort potatoes that pass along a roller conveyor. A camera with an angled mirror is mounted over the conveyor to give a clear view of the moving crop and to allow the monitor to be placed well away from the noise and dust of the grading line. When defective vegetables are seen on the screen the operator marks them for rejection with the probe. As this light and vibration sensitive instrument is placed against the image, it passes a signal to the control unit which pneumatically operates reject fingers beneath the conveyor. Unwanted produce is deposited on to another conveyor which lies along side the separator. Although designed initially

for produce, the system has many applications in other fields where quality selection is required. Capable of handling objects of irregular size presented in a random pattern, the sorting equipment is designed to improve the quality. (Industrial Products Finder. 8(1); 1979; 89)

343 Chop/mix/blend under a vacuum

Chopping under vacuum has many advantages, such as producing a more homogeneous emulsion eliminating air pockets from product. The Conti-Cutter, has the ability to mix as well as chop under vacuum. Capacity of the unit is from 2,000 to 9,000 pounds. The Conti-Cutter uses two stainless steel mixing screws and separately driven cutting heads to enable the product to be kept under vacuum for emulsifying. (Processed Prepared Food. 147(12); 1978; 91)

344 Tea dust making machine

Aluminium Industries' Super Mill is for making dust tea. Tea leaf which is fed into the grinding chamber is pulverised into fine powder by the sharp cutting edges of the carbon steel strikers rotating at about 4500 rpm. The dust tea is directed by a suction fan to the collector chamber and is directly discharged into the tea chest. (Industrial Products Finder. 8(1); 1979; 113)

345 Noodle cutter/sheet former

A new sheet former/noodle cutter has been introduced by Clermont Food Machine Company. The machine is capable of producing up to 3,000 pounds of noodles per hour, according to the company. The machine automatically mixes the pasta ingredients and forms it into a dough sheet. The sheet is then fed into the noodle cutter. The operation may be operated by a single person. The unit is available for production of 600, 1000, 1600 or 3000 pounds per hour. (Processed Prepared Food. 147(12); 1978; 71)

346 Fluid energy mills

Fluid energy mills find extensive application in the micronisation

of most powders. Conventional grinding equipment is capable of grinding materials to about 325 mesh. Fluid energy mills use compressed air or gas or high pressure steam to grind and classify the powders to the low micron ranges. Micronised powders find extensive applications in industries such as food products, pharmaceuticals, pesticides, chemicals etc. Mills in six different sizes are available to grind from a few kg/hour to a few tonnes/hour. Material can be ground to less then 1 to 5 microns. (Industrial Products Finder. 8(1); 1979; 271)

47 Filter material

Polygur-6000: filter material has better properties than conventional porous materials like ceramics and metals. It is resistant to concentrated and dilute acids, solvents, ketones aldehydes and alcohols. The materials is also recommended for contact with food-stuff. It attracts dust. Plates made out of Polygur-6000 can be cut, punched and machined. The material is also available in the form of candles, thin sheets or blocks. (Industrial Products Finder. 7(11); 1979; 65)

8 De-fatting screen for potato products

A de-fatting screening conveyor for chips, croquette potatoes and other fried potato products has been developed. The new screen reclaims a high level of excessive fat and provides a clean product with better visual appeal. With the high cost of fat, the company claims that in certain installations the "Payback" period of the unit could be less than 12 months. (Food Trade Review. 48(7); 1978; 411)

9 Cooker for canned fruits

A continuous agitating processing cooker for canned fruits, possessing specific advantages over the widely used batch type machines, has been designed by MERADO, Madras. The design developed enables processing from the time the syrup is poured into the can to the point when the processed can is delivered ready for sale. Ideally suited for small scale industrial units under Indian conditions which cannot afford the big batch type machines that are mostly imported, the machine can process fruits at the rate of 700 cans/hr (A $2\frac{1}{2}$ size cans) at atmospheric pressure

and controlled temperatures up to 100°C. The machine basically consists of a stationary shell with a rotor inside. It has two openings—one for the cans to enter in and the other for the cans to move out with the respective sloping gravity feed stands. The cans enter the cooker in the rolling position guided by the inlet feed stand through the inlet opening and get seated one by one in the rotor cage. The rotor is fabricated from angle sections which form pockets for the cans and these cans are advanced along these angles to the discharge position by Tee section spirals welded to the inside of the stationary shell.

When the rotor cage rotates, the advancement of cans takes place longitudinally in the bottom half only. As the shell is filled with hot water nearly to its half, the power required for advancement of cans is considerably low due to their tendency to float, reducing friction between the cans and the track; thereby there is less mechanical damage to the cans.

The specific advantages of this unit over the customary batch-type unit are: (1) Continuous and uniform heat treatment to the cans ensuring high quality of the product; (2) considerable saving in process time, energy consumption, labour and factory space; and (3) elimination of ancillary equipment like baskets, trolleys, pulleys, overhead hoists, etc.

The design drawing and know-how are available with the institute. (Technology Awareness Service. 4(4); 1979; 66-7)

350 Heating jackets

Thermo heating jackets are wrap-around electrical heating pads, tailored to the exact shape and size of a vessel. They incorporate flexible heating elements with in-built thermal insulation. The good contact between the heaters and the vessel to be heated results in highly efficient heating. As a result, the temperature of the heating elements is maintained to a minimum, increasing their life. The jackets are custom built to heat vessels of complicated shape like reaction vessels, storage tanks, valves, filters, pumps, flow meters, and distillation columns. (Industrial Products Finder. 7(11); 1979; 27)

1 Industrial toasters

For making crisp bread toasts, Economy offer heavy-duty industrial canteen toasters of 8 and 24 slice capacity. They are complete with stainless steel grills. The toasters are well insulated to prevent heat losses and incorporate heating elements and controls. They are suitable for working on 230 volts, AC supply. (Industrial Products Finder. 7(11); 1979; 25)

2 Oven-toaster-grill

The oven-toaster-grill can be used for roasting, grilling and toasting. It has a special toughened glass door in the front to enable checking of the food inside. With an inner capacity of 15.5 liters, the oven has 2 sheathed tubular elements of 600 Watts each. Temperature range is from 100 to 350°C. Suitable for industrial canteens and cafeterias, as well as domestic use, the oven-toaster-grill makes for quick and easy cooking. (Industrial Products Finder. 8(1); 1979; 371)

3 Multi deck ovens

Furnace Corporation manufacture multi deck ovens for drying, baking and processing. Heating is done by electricity, fuel oil, gas or coke. Temperature uniformity is achieved by circulating fans. Fuel saving is achieved by recirculating the hot gases. (Industrial Products Finder. 7(11); 1979; 29)

54 Low cost mechanical drying of paddy

A low cost system of mechanical drying of paddy suited for use near the farm has been designed, developed and field tested at the Regional Centre for Extension Service-Modernisation of Rice Processing, Annamalai University in Tamil Nadu.

Designed by Mr. M. Kuppuswamy, Chief Engineer (RM), Department of Food, Government of India, the unit consists of four cones and five cups arranged alternately one over the other and supported by mild steel channels.

Paddy flows over the hopper surfaces of the cones and slides down the inner surface of the cups, thereby getting mixed during the downward journey.

The discharged paddy at the bottom is lifted and recycled by means of an elevator till it is dried to the required moisture level.

For taking the discharged paddy either to the elevator boot or for direct bagging (after complete drying) a two-way valve is fixed beneath the bottommost cup. Hot flue gases (100 to 120°C) are passed through the mass of descending grain by means of a central perforated pipe.

Ash free flue gases are generated in a husk-fired furnace and forced into the dryer with a blower.

It takes about two hours to dry parboiled paddy (1,000 kg.) from 34 percent to 14 percent the safe moisture level per day.

The cost of the system (1,000 kg holding capacity) works out to Rs. 30,000 and that of drying one tonne of parboiled paddy(from 34 percent moisture to 14 percent) to Rs.6.

Three such systems will be erected at three co-operative rice mills in Tamil Nadu shortly. Also a committee, set up for the development of the Malnad areas of Western Ghats in Karnataka has proposed to erect the above systems for the benefit of farmers in the area. (The Hindu. 5.9.79; 17)

355 Copra dryer

Traditional method of smoke-drying copra, the "tapahan", produced low quality copra. New method, developed for small coconut farmers, (by Institute of Agricultural Engineering and Technology, at Los Banos, the Philippines) makes use of indigenous materials and utilizes coconut waste products for fuel. Portable and easily operated with minimum labour, it costs between US $68 to US $163 depending on the size. (Technonet Asia Digest (Supplement). Sept. 1979; 1)

356 Reducing energy in food freezing

Less energy and time are required for freezing vegetables for

market under a new process developed by the US Department of Agriculture. Vegetables frozen in -7°F (-20°C) liquid freezant require 25 percent less energy than those treated in conventional airblast freezers. Freezing times can be reduced from the present 25 to 2 minutes. The freezant consists of 15 percent table salt, 15 percent alcohol and 70 percent water. Selection of this combination is based on cost, flavor, safety lowered freezing temperature and pourability.

With a commercial-sized operation, vegetables frozen in a blast of cold air require large equipment because of the time required for heat to leave the product. Freezing time is reduced by circulating air rapidly past the product, but this consumes excess energy. Also, circulating air dehydrates vegetables and can result in losses up to 1 to 2 percent of the products weight. Direct immersion in a liquid freezant is fast, requires much less energy and doesn't dehydrate. Because it is fast, much smaller-sized equipment than currently used would be required for commercial operations.

The new process involves dipping blanched carrots, sweet corn, snap beans or peas in a 5 percent sugar solution for 1 minute followed by draining for 30 seconds. This step prevents pickup of freezant in the next step which could result in off-flavors. The dipped vegetables are placed in a freezer drum, which acts much like a conventional front-loading clothers washer, the drum rotates and thoroughly agitates vegetables in the freezant. Rotating at 50 revolutions per minute (rpm), the pilot-scale drum can freeze carrots and peas to approximately 0°F (-18°C) in 2 minutes. Other vegetables require slightly longer time. To remove excess freezant, the drum is drained and then spun at 200 rpm for 15 seconds. Blot drying vegetables with polyurethane foam blankets completes the process.

Taste panel evaluations showed that mixed vegetables prepared by the new process were equal to those prepared by conventional freezing techniques. (Food Production/Management. 101(5); 1978; 14,15)

Sorbate applicator system for use in bakery products

A new sorbate spray applicator system for use in extending the moldfree shelf life of yeast raised bakery goods has been introduced. In the new preservation method a small, even amount of potassium sorbate

solution is applied to the surface of bakery products as they come hot from the oven. The applicator's conveyor speed and mistspray are adjustable to the rate of production to assure the proper level of sorbate addition. Tests indicate that the shelf life of English muffins can be doubled or even tripled when preserved using the new sorbate applicator system. Studies suggest that English muffins preserved with potassium sorbate can retain their fresh, moist texture up to 30 days. (Food in Canada. 39(1); 1979; 9)

358 **Meat forming machine for delicate products**

A type VM 400 meat forming and portioning machine has been developed for forming hamburgers, meatballs, meatpieces, macaroni salad and other similar formed meat products. The special formplate filling system makes it possible to form and portion even delicate pieces. Because of this method the structure of the material is not destroyed. And in meat products, smear is minimized and a marbled appearance can be achieved. Because of a pneumatic/hydraulic control, the speed can be adjusted steplessly. Because the hopper can be raised automatically, the exchange of formplates is very simple and can be accomplished in a few minutes. (Processed Prepared Food. 147(12); 1978; 88)

359 **Heat control instrument**

Edwards High Vacuum has brought out a heat control device which will help speed up substances to be freeze-dried. Drying time can be cut down to half in the case of some products and has rendered obsolete certain traditional methods of determing safe drying temperatures for complex substances. This instrument is called the Edwards Resistivity Controller and can be fitted to almost any industrial freeze-dryer. (Climate Control. 2(5); 1978; 6)

360 **Leak detector**

A leak detector has been designed for use by refrigeration and dry cleaning engineers. Halogaz, can detect 0.02 percent at 750 ppm of refrigerant 22. A flexible hose is used to probe the area where a leak is suspected. The flame colour will change from blue to green to confirm

the presence of gas. The leak detector unit consists of a copper burner unit in a chrome housing with a holder for the disposable butane gas cartridge. Attached to the unit is a flexible neoprene hose through which air is drawn for combustion. (Climate Control. 2(5); 1978; 6)

1 High vacuum pumps

Toshniwal high vacuum pump consists of a rotor with two diametrically opposite sliding vanes rotating eccentrically in a stator bore. In each cycle of rotation, air is drawn from the system or vessel to be evacuated, compressed and released to the atomosphere through an oil immersed exhaust valve. The limited surface contact provided between the rotor and the stator prevents the back flow of the compressed gases towards the suction side. The range includes single and double stage rotary vacuum pumps which produce an ultimate vacuum of 10^{-2} and 10^{-3} torr, respectively. The capacity ranges from 50 litres/minute to 10,000 litres/minute. All pumps are provided with gas ballasting arrangement to enable them to handle water vapour and condensible gases. Applications are in distillation processes, dehydration processes, freeze drying of foods and in dairy industry. The pumps can also be used as forepumps to diffusion pumps, vapour booster pumps and mechanical booster pumps.
(Industrial Products Finder. 7(10); 1979; 15)

2 Distilled water plants

Jason Manesty Type automatic distillation water plants are electrically operated plants and manufactured entirely from stainless steel sheets to give pure distilled water at low operational cost. They are fitted with ejection type heating elements which will automatically cut off the current in case the water level goes below the heating level, preventing the elements from burning out. Available sizes are 2 litres/hour, to 25 litres/hour.
(Industrial Products Finder. 7(11); 1979; 57)

PACKAGING

363 Industrial packaging material

The Venus Water-Proof Products Mfg. Co. offer plain and bitumanised hessian bags with poly-lining; waterproof paper rolls; polythene bags and rolls; and printed HDPE bags. The products are used for packaging foodstuffs, chemicals, insecticides and pesticides. These are suitable for packaging in 10 g to 100 kg materials.
(Industrial Products Finder. 7(11); 1979; 73)

364 Nylon packaging for the food industry

A new food packaging film has been developed. Capran Nylon-6 film has been improved with better clarity and gloss compared to the old generation of nylon film. Key capabilities of the nylon film include good package integrity and product visibility. Available in thicknesses of two and three (commercial quantities) and 1, 1.25 and 1.5 mils (market development quantities), the Capran DeepForm nylon meets all applicable regulations of the United States Food and Drug Administration.
(Processed Prepared Food. 148(1); 1979; 104)

365 New pack to cut wastages

It has been estimated that a staggering Rs.3,500 crores of the annual gross national produce never reaches the ultimate consumer, being wasted either at production sites or at various stages in the chain of distribution. Besides, consumers at being defrauded to the extent of about Rs.2,000 crores a year by way of short weights and measures. Proper packaging will help check these malpractices.

Packaging products in retail flexible pouches will not only minimise adultration but also check losses of which the food grains alone constitute around 12 million tonnes. At the Indian Institute of Packaging, Bombay fruit packs have been redesigned, replacing the wooden crates (thereby conserving precious forest resource) with corrugated paper boxes. This helps

fruits and vegetables to retain their freshness from the time of picking to the time of ultimate consumption. Cartons for packing marine products have

Cartons for packing marine products have been constructed to minimise the use of ice, simplify handling and storage and eliminate hazards of climatic variations on the product arising from transportation over long distances. Right now, trials on tea shipments in bulk packs of corrugated fibre board boxes with aluminium foils are on.

New packs under study aim at reducing the cost of material, maintaining freshness of the content and ensuring the declared weights and measures and proclaimed quality.
(Times of India. 11.10.79; 10)

6 Containers to protect fragile bakery products

The Gazelle-Vanguard thermoformed containers supplied by Borden Thermoplastic 'provide almost total protection' for frozen desserts and fragile bakery products against the hazards of distribution and rough handling in frozen cabinets, shopping trolleys and shopping bags. The containers, it is claimed, will protect gateaux when the temperature rises the few degrees necessary for the cream to soften.
(Food Manufacture. 54(1); 1979; 69)
(Food Manufacture. 54(1); 1979; 69)

7 Polyethylene bags for oil

The IIP had recently developed low-cost small packs for edible oil. High density polyethylene containers had been found to satisfy all packaging conditions. The containers were for quantities of 250 grams to one kilogram. The cost of containers would range between 3.5 and 7 percent of the value of oil, depending upon the volume of production, which could be from one million to 10 million pieces of containers.

Shortly, IIP would approach manufacturers of edible oils to impress on them the need to use the scientifically-evolved containers. Already, the clearance of the food and drug administration had been sought. The Union Civil supplies Ministry would also be approached for its support.

Other packing media like polyethylene nylon-laminated pouches and metalised polyester packs were also now being experimented.
(Indian Express. 9.9.1979; 7)

368 Colour printed bags

Multi-colour printed polythene and polypropylene bags are manufactured by Flexo Print of Calcutta. Pre-treatment of the film surface by electronic corona discharge for permanent ink adhesion has made possible multi-colour printing on polythene and polypropylene. The bags are recommended for packaging confectionery. Printed polypropylene bags are especially suitable for packing food articles.
(Industrial Products Finder. 7(11); 1979; 29)

369 Food-safe inks

Food-safe inks for the printing of inserts, coupons, labels, boxes, wrappers, and other food packaging materials are accepted for direct contact with foods by the United States Department of Agriculture. Sold under the trade name No-Tox, the food-safe inks are made entirely from non-toxic, FDA-accepted materials. No-Tox food packaging inks are available in twelve standard colours plus white. Numerous other colours can be custom blended to meet customer requirements.
(Manufacturing Confectioner. 59(4); 1979; 91)

370 Safer packaging for pesticides

According to officials at the E.P.A., the U.S. Government will issue regulations to require child-resistant packaging for the most toxic pesticides found in American homes. Current regulations add about 3.74 cents to the cost of each pesticide package. According to the National Clearing House for Poison Control Statistics, about 6,500 children under the age of 5 were accidentally poisoned by ingesting pesticides in 1975. This number has also risen annually.

Child-resistant packaging will be required for home use products that are hazardous when swallowed, inhaled or spilled in the eyes or on

the skin. The regulations would give the firms involved up to two years to change their packaging.
(Food Packaging and Labeling. 2(12); 1978; 1)

Versatile vacuum packing machine

A new generation of deepforming packaging machine that combines electro-hydraulics with the latest FWM electronic systems has been developed. The speed, stroke length and die opening all can be set with the push of a button. Electronic feed-back controls insure to fluctuation in repeat lengths even if the machine is run at full speed.

In addition, it has an infinitely variable drive speed control and an infinitely variable acceleration and deceleration profile for the advance of the package through the machine. For products like pre-cooked meals, the package is accelerated and slowed down again smoothly. Dixie Thermoprint date-coders, dosing units and other attractive features are also available on this machine.
(Processed Prepared Food. 147(12); 1978; 91)

Vertical heat sealing machine

Samseal Machines have developed a vertical heat sealing machine for sealing packaging materials such as Hermitet and Ceka cartons. Besides, polythene, poly laminated foil pouches and fibre-woven poly laminated bags can also be sealed with this machine. The base plate and side plates are made out of CI castings to ensure durability and even to withstand rough use. The machine is mounted at an appropriate height on a fabricated frame. MS angled frame. The sealing jaw is fitted in such an angular position that the operator can view the sealing portion clearly. An adjustable platform has also been provided for the filled cartons to rest on while sealing. The machine is foot operated and has a metal clad sealing jaw of 450 mm (18") length, with a sealable area of 6 mm ($\frac{1}{4}$") having a double seal (3 mm seal, 1.5 mm gap and again 1.5 mm seal). Two machines are fitted on one frame keeping in mind a compact set up. In 3 m x 3 m space with the help of 5 workmen, a fully packed product can be kept ready for dispatch at the rate 15 to 25 cartons per minute (i.e. sealing + glueing + filling + sealing + glueing and dispatch).
(Industrial Products Finder. 8(1); 1979; 265)

373 Ampoule filling and sealing machine

The United Engineering Co. has introduced a high-speed three-stroke automatic ampoule filling and sealing machine. It can fill 1 ml to 5 ml capacity ampoules with syringes of SS 316 quality with drip-proof arrangements. The ampoules are flushed with nitrogen or CO_2 gas before and after filling. The machine has a 3/4-HP motor and is operated by only one operator to produce 3,600 to 4,800 ampoules per hour. The ampoules are fed automatically from an SS feeding hopper and collected automatically in a collection hopper. All contact parts can be easily dismantled for sterilisation. Lower speed machines are also available.
(Industrial Products Finder. 7(11); 1979; 17)

374 Simplified high speed sweet wrapping machine

Littlethorpe, England-A high speed confectionary wrapping machine developed by a British Company incorporates design innovations which are claimed to give substantially lower manufacturing costs, greater reliability, easier maintenance and increased adaptability compared with conventional machines. It is aimed primarily at the bubble gum, chewing gum, and toffee industries. It can cut and individually wrap up to 1,000 sweets a minute and collate and over-wrap them to form a stick pack. Variants are available to wrap individual preformed sweets such as boilings and hard candy; to produce stick packs with a single end twist; and to cut and wrap products on the rope with either a double end twist or end folds, to count and collate to a required weight and bag them in a form-fill-and-seal bagging unit.

Through the mechanical simplification achieved, the 1500 costs little more than half the price of conventional machines in the same speed brackets
(Food in Canada. 39(1); 1979; 10)

ANALYSIS

Metal detector for granular products

The Cintel Microsearch metal detector by Rank Precision Industries, employs a small, high sensitivity detector head and a remote electronics unit for use in the screening of products fed through a pipe or similar conveyance system. Typically these include products fed to can filling machines and the feed of powdered or granular materials. A solid cast detector head and a solid state pre-amplifier integrated within insure that the signal generated is large enough to be unaffected by any local interference. A built-in fault checking system monitors the electronic circuit, activating a visual display on the control panel in the event of a system failure.
(Processed Prepared Food. 147; 1978; 112)

Measure salt content directly with analyzer

The Dicromat Salt analyzer has been introduced by Diamond Crystal Salt Company. The salt solution is poured through the analyzer and a digital readout is displayed showing the salt content of the brine. It is an alternative method to the silver nitrate/potassium dichromate titration method. Advantages of the analyzer include speed of execution and case of operation compared to titration.
(Processed Prepared Food. 147(12); 1978; 89)

Grain protein moisture results in 5 seconds

One of a new series of grain analyzers, the Model 101 Analyzer from Neotec Instruments, Inc. is able to display protein and moisture results from cereal grains in five seconds. Model 101 Analyzer exceeds USDA ST-19 requirements for accuracy with a standard deviation on repeat readings of the same sample of 0.025 percent or better. New features on this model include a more efficient power supply and improved IC chip memories.
(Processed Prepared Food. 148(6); 1979; 102)

378 Measurement of gel strength

The Boucher electronic Jelly Tester automatically measures the gel strength of products and produces a digital readout of accurate, reproducible grams Bloom values.

The instrument has been designed to enable non skilled operatives to obtain accurate results fast: a 200g Bloom measurement takes 30 Sec. Operation is by two illuminated push buttons, one to zero the instrument, the other to initiate the test cycle. Each button lights up when the instrument is ready.
(Food Trade Review. 48(7); 1978; 411)

379 Quality analyzer

An instrument called the Food oil-sensor Oil Quality Analyzer has been developed. It utilizes the dielectric property of oils to detect, measure, and report the level to which a frying fat has degraded over its useful life. This instrument provides the user in minutes with what, to date has not been obtainable except through laboratory analysis. This is very useful in food service kitchen - it heats a used sample of frying oil to 174°F and indicates the change in dielectric constant from that of an unused sample; the change in dielectric constant is directly related to the degree of degradation in the quality of the oil.
(Food Technology. 33(9); 1979; 50, 52, 56, 57)

380 Freshness of fish

This is done by the portable electronic instrument-called the Torrymeter. The Torrymeter features a digital display, high operating speed, a sensing head which contains the electrodes through which electrical measurements are made; and a capacity to handle single shot operation and batch assessment. In operation: an operator selects the required operating modes and places the sensing head in firm contact with the fish skin. The digital readout then displays freshness measurements.
(Food Technology. 33(2); 1979; 87)

Detect aflatoxin in five minutes

Blak-Ray line of ultraviolet lamps are good for primary detection of aflatoxin contamination. Early detection of potential contamination is vital in preventing cross contamination and large scale loss. The corn or other grain sample is inspected for a bright greenish-yellow fluorescence which, if present, indicates possible contamination. Further tests are necessary for confirmation and quantification. The high intensity of the Blak-Ray line makes detection easy, even in well lighted areas.
(Processed Prepared Food. 147(12); 1978; 112)

Spectrophotometer

A double beam recording spectrophotometer for near IR range 13,500 to 3,000 cm^{-1} (740 to 3,300 nm) is manufactured by VEB Carl Zeiss, Jena. It permits extinction and transmission measurements of solid, liquid and gaseous samples, and incorporates filter/grating monochromator with continuously variable slit programme. Scale expansion on wave-number as well as transmission scales is possible. Other features include four scanning speeds, three time constants and posibility of repetitive scanning, scanning at fixed intervals, etc. Connection to process control computer is possible. The spectrophotometer is available on rupee payment.
(Industrial Products Finder. 8(1); 1979; 307)

ECONOMIC & COMMERCIAL STATISTICS

Production of oilseeds in India during 1978-79

	Area ('000 hectares)	Production ('000 tonnes)
Groundnut	7548.1	6387.0
Rape and mustard	3556.9	1877.2
Sesamum	2441.0	539.7

(Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Government of India.)

Production of coriander, dry chillies and ginger in 1978-79

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Area: thousand hectares | Production: thousand tonnes

State	Coriander		Dry chillies		Ginger	
	Area	Production	Area	Production	Area	Production
Andhra Pradesh	104.7	35.9	140.2	175.0	2.00	2.00
Assam	*	*	10.6	6.3	*	*
Bihar	8.0	4.4	19.2	21.0	0.69	0.62
Gujarat	*	*	13.5	8.9	0.26	0.20
Haryana	0.4	0.1	12.6	13.1	0.06	0.09
Himachal Pradesh	*	*	0.8	0.2	2.49	1.35
Jammu and Kashmir	*	*	1.3	0.7	*	*
Karnataka	20.6	2.2	138.7	43.8	1.53	1.99
Kerala	*	*	2.8	2.5	10.66	28.06
Madhya Pradesh	68.9	22.1	54.0	11.0	1.78	2.21
Maharashtra	*	*	149.6	76.1	0.75	0.65
Manipur	*	*	2.6	1.6	1.47	2.94
Meghalaya	*	*	1.2	0.8	4.27	16.80
Nagaland	*	*	1.5	1.0	0.31	0.28
Orissa	15.2	6.5	66.7	33.2	3.55	2.55
Punjab	*	*	13.0	11.1	*	*
Rajasthan	80.4	47.1	44.1	20.2	0.19	0.22
Tamilnadu	58.3	25.1	91.3	185.2	1.04	0.92
Tripura	*	*	1.1	0.3	0.50	0.64
Uttar Pradesh	10.3	4.6	19.6	7.0	0.32	2.08
West Bengal	*	*	20.6	18.3	2.39	3.45
Delhi	*	*	0.1	0.3	*	*
Mizoram	*	*	0.3	0.1	0.07	0.12
Pondicherry	*	*	0.2	0.2	*	*
All India	366.8	146.0	805.6	637.9	34.33	67.17

*Coriander/Dry Chillies/ Ginger is not grown in appreciable extent in these states/Union teritories and in other states/union teritories not mentioned

(Directorate of Economics & Statistics, Ministry of Agriculture & Irrigation, Government of India, New Delhi)

Production of Potato and Tapioca in 1978-79

Area: thousand hectares / Production: thousand tonnes

States	Potato		Tapioca	
	Area	Production	Area	Production
Andhra Pradesh	0.3	0.5	11.2	97.9
Assam	34.8	176.8	1.1	4.5
Bihar	141.6	1140.4	*	*
Gujarat	10.5	206.4	*	*
Haryana	14.8	267.7	*	*
Himachal Pradesh	13.6	70.0	*	*
Jammu & Kashmir	2.6	9.0	*	*
Karnataka	9.8	91.0	1.5	20.3
Kerala	*	*	289.9	4226.3
Madhya Pradesh	21.0	19.8	*	*
Maharashtra	10.9	51.0	*	*
Manipur	2.2	13.0	*	*
Meghalaya	18.0	121.8	2.1	11.6
Nagaland	3.0	14.0	*	*
Orissa	8.5	61.2	*	*
Punjab	36.4	727.2	*	*
Tamilnadu	13.6	102.6	54.8	1681.9
Tripura	2.3	32.5	0.2	0.6
Uttar Pradesh	281.3	4359.3	*	*
West Bengal	161.5	2444.0	*	*
Delhi	0.2	1.21	*	*
Mizoram	0.5	0.3	0.1	0.2
Pondicherry	*	*	0.5	9.3
All India	790.3	10125.4	361.4	6052.6

(Contd....

*Potato/Tapioca is not grown in appreciable extent in these states and other states/union territories not mentioned here.
(Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Government of India, New Delhi)

386 Production and exports of cottonseed and oilcake

India produced 2,800,000 tonnes of cottonseed and exported 2,18,000 tonnes of oilcake in 1978-79.
(Oils & Oilseeds Journal. 31(4); 1979; 37)

387 Egg output

India's total egg production from April 1979 to March 1980 will be in the region of 13,968 million. This excludes duck eggs, the production of which would be around 400 million. It is estimated that during 1979-80, 21 eggs will be available for every Indian as compared to only 10 in 1971. This figure is much less than when compared to the availability of eggs during 1979-80 in Mauritius which will be 60, in Kenya 102 and 209 in Malaysia.
(The Economic Times. 19(162); 1979; 5)

388 Availability of pulses

The percapita net availability of pulses in 1977 and 1978 is calculated as 43.6 and 44.4g per day.
(Eastern Economist. 73(3); 1979; 130)

389 National Income goes up

The net national income of India stood at Rs.433,950 million (1977-78) as compared to Rs.403,950 million during the previous year according to the Central Statistical Organisation (CSO) which accounts for a 7.4% increase. The per capita income at 1970-71 prices during the year 1977-78 stands at Rs.690 as compared to Rs.656 in 1976-77. This shows an increase of 5.2 percent in 1977-78. The increase during 1977-78, is more than three times the average increase of 1.47 during the past 28 years.
(Economic and Commercial News. 9(3); 1979; 8-9)

Exports of processed foods in 1978-79

Quantity in tonnes
Value in Rs. lakhs

Sub-groups	Quantity	Value
Meat, Poultry products and animal easings	151585.8	1927.65
Biscuits and confectionery	4160.3	305.40
Guar-gum and guar meal	71126.7	2412.86
Wheat bran	2012.6	14.35
Milk and milk products	1772.6	223.77
Starch and derivatives	32367.9	244.91
Papads	1555.1	100.96
Instant Coffee	403.4	360.84
Instant tea	570.2	304.38
Walnuts	3806.3	606.66
Fruit and vegetable products	135956.4	1513.56
Fresh fruits and vegetables	129325.3	2233.95
Others	1201.3	686.80
		10934.09

(The Economic Scene. 4(7); 1979; 30)

Export of linseed oil and meal

India exported 42,261 tonnes of linseed oil and 147,000 tonnes of oil cake and meal during 1976-77.
(Oils & Oilseeds Journal. 31(4); 1979; 37)

Cumin seed exports

India exported about 1,816 tonnes of cumin seed valued more than Rs.280 million to overseas countries, mainly to Japan, Nepal, UK, USA etc. during 1978-79.
(Economic and Commercial News. 9(34); 1979; 5)

Export duty on coffee reduced

Having regard to the fall in international prices of coffee

recently, the Government of India has reduced the rate of export duty on coffee from Rs.900 per quintal to Rs.730 per quintal with effect from August 4, 1979.
(Economic and Commercial News. 9(33); 1979; 2)

394 Export duty exemption on instant coffee extended

The Government of India has exempted instant coffee from export duty leviable thereon. This exemption was granted in order to improve the competitive position of Indian instant coffee in international markets. The exemption after review has been extended upto the end of February, 1980.
(Economic and Commercial News. 9(38); 1979; 6)

395 Restrictions on imports

The Kuwait Government has issued a new decree empowering their Ministry of Commerce & Industry to supervise trading in all commodities. Under this new decree, importers of all commodities are required to notify to the above ministry the quantity, cost and other details of all imports within a specified period failing which they would be liable to fines and, in some cases, cancellation of trading licences. The decree also stipulates a severe punishment including prison terms between 3 months and 3 years plus fines for unfair trade practices.
(Spices News Letter. 13(17); 1979; 2)

FOOD LEGISLATION, QUALITY CONTROL AND HYGIENE

396 Edible oils brought under storage control order

The Union Government has decided to bring imported edible oils within the stock limits as provided under the pulses, Edible Oil Seeds and Edible Oils (Storage Control)) Order, 1977. It takes away exemption granted for purposes of stock limit to the imported oil. This decision is aimed at dehoarding of stocks at all levels of all oils. A notification to this effect as on September 21, 1979 was issued. The notification

also provides that a State Government may fix a stock limit, if it considers it necessary, below the maximum limit fixed under the Order. The notification also removes the stock limits for mustard seeds, mustard oils at producers level. It also enlarges the definition of producer to include a refiner. The bulk consumer has been defined to include an educational institution with hostel facilities, a hospital or a religious or charitable institution.
(Economic and Commercial News. 9(40); 1979; 8)

Definition of junk food

The Department of Agriculture has again proposed a standard definition of what junk foods are in relationship to the nation's school lunch program. Junk foods are those that don't contain at least five percent of US recommended dietary allowance of one or more of eight essential nutrients, says the Department. In schools that have federally subsidized lunch programs, they should not be sold until after the last school lunch period in the day. The eight essential nutrients are protein, vitamin A, ascorbic acid, niacin, riboflavin, thiamine, calcium and iron. The standard would rule out the selling soda pop, water ices, chewing gum and some candies in competition with lunches in 98 percent of the nation's schools.

US taxpayers spend about $3 billion a year on federal child nutrition programs. They have a right to expect them to work well and to contribute to their children's well being.
(The Nation's Health. August 1979; 3)

Agar-agar affirmed as GRAS

FDA has affirmed that agar-agar is GRAS as a direct human food ingredient with specific limitations. Details are in the Federal Register of April 3.
(Food Technology. 33(5); 1979; 208)

GRAS status proposed for cellulose derivatives

According to a proposed rule making by the Food & Drug Administration

Sodium carboxymethyl-cellulose and methylcellulose as direct food ingredients and carboxymethyl cellulose, ethylcellulose, cellulose acetate, and regenerated cellulose as direct human food ingredients will be recognised as generally safe. The status of pure cellulose including microcrystalline cellulose will be addressed in a future proposal.

The scientific literature suggests that an orally administered cellulose and its derivatives pass unchanged through the gastrointestinal tracts of rats and man. Cellulose is of course a major constituent of many foods and such as a significant portion of the human diet.
(Food, Nutrition and Health newsletter. 3(1); 1979; 2)

400 GRAS status to ascorbates and copper salts

Tentative conclusions on the safety of certain ascorbates and copper salts have been reached by FASEB's Select Committee on GRAS Substances. L-ascorbic acid, sodium L-ascorbate, calcium L-ascorbate, ascorbylpalmitate (Palmitoyl L-ascorbate), copper gluconate, cuprous iodide, and copper sulfate are considered safe at current use levels and levels that might reasonably be expected in the future. Erythorbic acid (D-isoascorbic acid) and sodium erythorbate (Sodium D. isoascorbate) are considered safe at current use levels, but additional data are needed to determine safety at increased levels. Details are in the Federal Register of March 9.
(Food Technology. 33(5); 1979; 208)

401 GRAS status to hydrogenated fish oil

FDA has affirmed that hydrogenated fish oil is GRAS as an indirect human food ingredient. Details are in the Federal Register of May 15.
(Food Technology. 33(7); 1979; 96)

402 Mercury in seafood

FDA has announced the availability of an administrative guideline increasing the action levels for mercury in fish, Shell fish crustaceans, and other aquatic animals from 0.5 ppm to 1.0 ppm, as recommended by the National Marine Fisheries Service. FDA has also withdrawn its proposal to establish action levels by formal regulation and will thus continue to

regulate mercury levels through an action level rather than a formal tolerance. Details are in the Federal Register of Jan. 19.
(Food Technology. 33(3); 1979; 99)

Effect of mustard and rapeseed oil on heart

The consumption of rapeseed and sarson oils lead to the fattening of heart muscles in rats according to a recent medical study. Rats treated with mustard or rapeseed oil showed a significant increase in the triglyceride content of the heart than that of groundnut oil fed group after 10 and 20 days of feeding. The cholesterol was also increased after feeding mustard and rapeseed oils for 150 days. A higher collagen content in the heart of rats fed on mustard oil and rapeseed oil was also observed.

The acute effect of mustard oil and rapeseed oil seems to be lipidosis (fattening) and these events could cause damage to the muscle fibres.
(Indian J. Exp. Biol., 17(9); 1979; 918-21)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

Cashew Development Corporation in Orissa

A Cashew Development Corporation with an authorised capital of Rs.5 crores is proposed to be set up by the Orissa Government for systematic development of cashew plantation in the state. While the State Government will contribute 51 percent towards equity capital, the balance 49 percent will be held by the Central Government. The Corporation will undertake cashew cultivation in 25,000 hectares of government land and would rehabilitate 8,000 hectares of existing plantation raised by the soil conservation organisation.
(Industrial Development News. 13(11); 1978; 137)

405 Indo-Australian apple project

The Governments of India and Australia signed in New Delhi recently a memorandum of understanding concerning an Indo-Australian apple grading and storage project at Sopore in Jammu and Kashmir State. The project is aimed at enhancing orderly marketing of the apple crop in the state, stimulate and expand consumption and ensure continuing and fair economic return to producers.

These objectives will be achieved by:

a) Establishment and demonstration of simplified and practical grading, sizing and packaging standards along lines similar to those used in international trade in apples;

b) Construction and demonstration of the use of packhouse-coldstore complex in a major apple-producing district of Jammu and Kashmir to serve as a prototype;

c) Advice to, and training of, State Government horticulture staff in the setting up of apple grading, sizing and packaging standards, their implementation, and subsequent means of enforcement through an inspection service;

d) Short-term training in Australia for policy-making and technical staff on apple grading, sizing, presentation and marketing; and

e) Conducting a programme to ensure thorough spraying and control of apple scab in upto 81 acres of orchards supplying fruit to the packhouse-coldstore complex.

The total commitments of the Government of India and Government of Australia for this project will amount to Rs.3 million and $A290,000 (equivalent to Rs.2.6 million) respectively, spread over a period of two years. (Economic and Commercial News. 9(29); 1979; 3)

406 Rs.485.5 Cr project to meet milk needs in the next decade

The Union Cabinet approved Rs.485.5 crore project for dairy development phase II of the 'operation flood'. The project seeks to meet the

country's milk requirements during the next decade. The project seeks to raise milk out-put in regions covered under the 'operation flood' schemes from 3.9 million litres a day to 78.3 million litres. The second phase spread over seven years will help India to establish a viable self-sustaining dairy industry. The 'operation flood-II' is proposed to be financed primarily from funds to be generated from the sale of the EEC donated commodities worth Rs.235.2 crores and a World Bank loan of about Rs.173 crores. The balance of Rs.73.3 crores will be funded from the internal resources by the Indian Dairy Development Corporation.

The project will enable the milk producers to rear some 1.5 crore cross-bred cows and upgraded buffaloes. It aims to establish a milk grid linking milksheds to urban demand centres with a population of about 15 crores. As a result of the 'operation flood' which ends in June next, about Rs.92 crores had already been generated by sale of commodities donated by the world food programme and Rs.77 crores had been utilised for dairy development.
(Dairy Guide. 1(1); 1978; 66)

Milk powder plant at Salem

A milk powder plant would be set up at Salem Tamil Nadu at a cost of Rs. 4 crores. A pasteurisation plant also would be put up at the factory which will produce ghee and other milk products.
(Dairy Guide. 1(1); 1978; 68)

Beverage bottling plant expansion

A ready-to serve beverage bottling unit, set up at Hyderabad by the A.P. State Agro Industries Corporation, is being expanded from 2000 bottles per shift to 14,000 bottles.

The unit processes ready-to-serve beverages, tinned fruit and bottled juice under the brand name of APSA and APSARASA. The three popular soft drinks are mango, pineapple and flavoured mixture of mango and pineapple called PINGO. The annual target of soft drinks is 20 lakh bottles.
(Industrial Development News. 13(11); 1978; 142)

409 India's food processing units lauded

The International Labour Organisation (ILO) has commended India's efforts for setting up food processing units in small scale sector in a special report on food processing and drink industries in developing countries. The ILO has cautioned against going in for sophisticated and highly mechanised production methods which may be a short cut to industrialisation. They tend to fail in providing jobs and cheap essential foods for large number of people. Some two thousand small scale units now in operation in the rural areas of India have reduced local unemployment. In contrast, a bakery in an African country has imported a $ 1000 oven that needs only four men to operate.
(Economic and Commercial News. 9(40); 1979; 10)

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